



FRIDAY, SEPTEMBER 21.

Road-Masters' Association of America.

The Road-Masters' Association of America held its first regular meeting in St. Paul, Minn., Sept. 12, pursuant to the resolutions adopted at the preliminary meeting held in Chicago last June. For the following account of the meeting we are chiefly indebted to the reports published in the St. Paul Pioneer-Press:

The meeting was called to order at 2:30 p.m. on Sept. 12 by President I. Burnett, and the roll was called by the Secretary, Mr. J. Tierney. The following delegates answered to their names:

I. Burnett, Chicago, Rock Island & Pacific Railroad; Thomas Rafferty, Chicago, Milwaukee & St. Paul; Thomas Adams, Baltimore & Ohio; J. H. Preston, Chicago, Rock Island & Pacific; T. Raynor, Chicago & Grand Trunk; J. A. Crippin, Des Moines & Fort Dodge; J. B. Moll, Chicago, Milwaukee & St. Paul; David Wright, Chicago, Milwaukee & St. Paul; A. Cox, Chicago, St. Paul, Minneapolis & Omaha; George B. Tripp, Chicago, Milwaukee & St. Paul; Thomas Adamson, Ohio & Mississippi; J. C. McQuestin, Cincinnati, Indianapolis, St. Louis & Chicago; John Turney, Chicago, Rock Island & Pacific; C. R. Meeker, Chicago, Burlington & Quincy; and O. D. Richards, Lake Shore & Michigan Southern.

The committee on by-laws submitted their report recommending the adoption of the by-laws as they now stand and the discharge of the committee, which, on motion of Mr. McQuestin, was done.

The following new members came forward, signed the roll and paid their initiation fees: P. J. Kelley, Cincinnati, Indianapolis, St. Louis & Chicago; A. Moore, Cincinnati, Indianapolis, St. Louis & Chicago; E. H. Nutt, Green Bay, Winona & St. Paul; James Sloan, Chicago & Eastern Illinois; J. H. Bowen, Chicago, Milwaukee & St. Paul; R. H. Hennessey, Chicago, Milwaukee & St. Paul; C. H. Stockwell, Chicago, Milwaukee & St. Paul; J. E. Cox, Chicago, Milwaukee & St. Paul; G. W. Downing, formerly Chicago, Rock Island & Pacific; J. C. Brennan, St. Paul, Minneapolis & Manitoba; M. A. Stafford, Central Iowa; C. D. Shattuck, Chicago, Milwaukee & St. Paul; George M. Williams, Chicago, Rock Island & Pacific.

THE PRESIDENT'S ADDRESS.

The President then read his first annual address. He said it was one of the first duties of railroad men to be on time, and he congratulated those present upon their promptness. Solomon had said it is not good for man to be alone. He practiced as he preached, for he was married, if history be true, to 300 women. With all due respect to him, he was glad he did not belong to the Association. If he did, and brought his family, they would have to charter a couple of excursion trains and a lot of private detectives to watch the gray-headed members [laughter]. It is not good for man to be alone. All classes of society band together for mutual advancement, and so the most worthy thoughts of each become the property of all. Referring at some length to the object of the society, the President continued:

"The God of creation has made no beast swift and strong enough to satisfy the demands of impatient and restless man. So man has supplied the deficiency by the exercise of his marvelous genius. The master eye has been upon the path and paved it smoothly for the flying train laden with human freight. He wished to say a word for the men who deal the hard blows, face the bitter storms, swelter in the relentless heat and brave the life-chilling cold for a pittance per day. They live hard, work hard and many of them die hard. They are called to throw themselves against the elemental forces of nature; to overcome by the efforts of human flesh and blood the obdurate rock, the stubborn iron, the heavy clay and the unyielding resistance of the plain, the forest and the mountain. In conclusion he said: It is for our mutual improvement, for the improvement of those who labor under our direction, that we are met here to-day. I feel the importance of this Association to the country, whereby we may openly discuss questions and arrive at conclusions as to the best materials and devices to be used in railroad construction and repairs."

A number of communications were received and appropriately referred. Invitations from the Chicago, Milwaukee & St. Paul and the St. Paul, Minneapolis & Manitoba companies were received and accepted.

The subject of ditching was then taken up and discussed by Messrs. Preston, Cox, McQuestin, Sweeney and others. Mr. Cox explained the working of a steam ditching machine he had seen.

The meeting then adjourned until the next day.

SECOND DAY.

In the morning the members went by special train out on the Hastings & Dakota Division of the Chicago, Milwaukee & St. Paul road to see a steam ditching machine in operation there.

The business session was held in the afternoon. The meeting having been called to order, the following new members were admitted:

C. R. Cornell, T. A. Herb, Chicago, Milwaukee & St. Paul; Joseph Hayward, Kansas City, St. Joe & Council Bluffs; J. B. Keely, Chicago, Milwaukee & St. Paul; M. D. Kelly, St. Paul & Duluth; J. J. Brennan, St. Paul, Minneapolis & Manitoba; T. Hines, I. T. Moran, I. Sullivan, Illinois Central; J. A. Mayer, St. Paul, Minneapolis & Manitoba; John McMillan, A. B. Hyde, Chicago, Milwaukee & St. Paul; M. Hanley, Fargo Southern.

The subject of Rail Joints, Fastenings and Nut Locks was then taken up.

Mr. MOLL of the Chicago, Milwaukee & St. Paul Railway, was first called upon for a statement of his views. He stated that the angle-bar is much stronger than the fish-bar, yet the angle joints after considerable traffic permit the ends of the rails to sag; with the fish-bar it is possible to remedy this difficulty; his company use angle-bars 20 in. to 24 in. in length. He contended that it is possible to make a better riding track and a smoother track with the fish-bar joint than with the angle-bar.

The President said he had received a letter from the Chief Engineer of the Pennsylvania Railroad, stating that at a recent test of the two joints the fish joint broke at a strain of 48,000 pounds, and the angle-bar withstood the test up to 78,000 pounds.

Mr. ADAMSON used the angle-bar; generally put a tie under the joint; use vulcanized fibre nut lock; had also used Pratt and Verona nut lock; preferred the vulcanized fibre; have experimented with them for two years, and found them intact after being fixed in place for that length of time. Great care must be taken that they do not get damp before putting them on.

Mr. MORAN used the angle plate, and considered it the best

joint; the tie is under the joint; use Verona nut lock; deem it the best.

Mr. COX liked the angle-bar best; we make a suspended joint; if we had double-track, I think the angle joint would still be preferable; use the Verona nut lock.

Mr. HAYWARD used the fish-bar and angle-bar; have been using the latter for three years. We use the 22 in. bar with spike holes in the centre, and put the tie right in under the joint; find about 50 of them break to one of the plain splice joints. This, I think, is due to the slot hole being in the centre of the bar; have found the Pratt a good nut lock for about six years; after that it is useless. The vulcanized fibre is no good. The best that I have ever found is the Harvey grip bolt, some of which we have had in use for seven years, and they give satisfaction; have been using the Verona nut lock for three years. The Harvey grip lock can be used again and again, as they retain all their elasticity.

Mr. BRENNAN: We use angle bar and fish joint; used former four years; prefer the angle-bar, because it makes a firmer and stronger joint; but being a suspended joint the rails sag; it works the same on different classes of rails; use no nut locks save as experiments.

Several other delegates spoke on the subject, and a good many different views as to the ability of the several materials named above were enumerated, and at 5 o'clock the association adjourned to 7:30.

At the evening session an address was delivered by Mr. Preston which was largely devoted to setting forth the claims of road-masters to a more substantial recognition of their services.

The Committee on Drainage, consisting of Messrs. James Sloan, P. J. Kelly and D. L. Sweeney, presented the following report:

"Your Committee on Drainage beg leave to report as follows: For stone and gravel ballast the ditch should be at least 7 ft. and not to exceed 12 ft. from the rail, and at least 2 ft. below the bottom of the slope; to commence 3 in. above the bottom of the tie and not to exceed 2 in. per foot. For mud track the slope to commence from the bottom of the tie."

The convention then adjourned until the next day.

THIRD DAY.

The morning was devoted to an excursion to Lake Minnetonka over the St. Paul, Minneapolis & Manitoba road.

At the afternoon session the following officers were elected for the ensuing year:

President, I. Burnett, Chicago, Rock Island & Pacific, Joliet, Ill.; First Vice-President, John Brennan, St. Paul, Minneapolis & Manitoba, Minneapolis; Second Vice-President, James Sloan, Chicago & Eastern Illinois; Treasurer, Thomas Adams, Ohio & Mississippi; Secretary, C. R. Meeker, Chicago, Burlington & Quincy; Member Executive Committee for three years, S. L. Sweeney, Wabash, St. Louis & Pacific Railroad, Bement, Ill.

Resolutions were adopted thanking the state officers for the use of the capitol; Superintendent Bronson, of the Union depot, for attentions and courtesies; the Chicago, Milwaukee & St. Paul Railway for special train; the St. Paul, Minneapolis & Manitoba Railway for special train to Minnetonka, and specially thanking Superintendent McKernan for special train to Fargo and return.

After selecting Indianapolis as the place for holding the next convention, the association adjourned until September, 1884.

A number of the members joined in an excursion to Fargo on a special train provided over the St. Paul, Minneapolis & Manitoba road, leaving St. Paul on the morning of Sept. 15, and returning the following day.

New Standard Wire Gauge.

The British Board of Trade, with the authority of "Her Majesty in Council," has legalized the following new standard wire gauge:

Denominations of Standards:

Descriptive number.	Equivalents in parts of an inch.	Descriptive number.	Equivalents in parts of an inch.
No. 7/0	.500	No. 23	.024
6/0	.464	24	.022
5/0	.432	25	.020
4/0	.400	26	.018
3/0	.372	27	.0164
2/0	.348	28	.0148
0	.324	29	.0136
1	.300	30	.0124
2	.276	31	.0116
3	.252	32	.0108
4	.232	33	.0100
5	.212	34	.0092
6	.192	35	.0084
7	.176	36	.0076
8	.160	37	.0068
9	.144	38	.0060
10	.128	39	.0052
11	.116	40	.0048
12	.104	41	.0044
13	.092	42	.0040
14	.080	43	.0036
15	.072	44	.0032
16	.064	45	.0028
17	.056	46	.0024
18	.048	47	.0020
19	.040	48	.0016
20	.036	49	.0012
21	.032	50	.0010
22	.028		

The British Trade Journal points out that on and after March 1, next, no other wire gauge can therefore be used in that country—that is to say, no contracts or dealings can be legally enforced which are made by any other sizes than those above given. All wire drawers and users of the Birmingham wire gauge would do well, therefore, to provide themselves with gauge-plates corresponding to the above sizes.

Mr. Fink on Railroad Combinations.

The Senate Committee on labor and education, apparently not finding that subject big enough for them, summoned Mr. Albert Fink to appear before them, and last Monday he gave the following testimony as reported by the New York Times:

Albert Fink, the father of the railroad pooling system and the present Commissioner of the trunk line pool, was before the Senate Committee on Labor and Education during the greater part of its session yesterday. He gave an interesting account of the causes which led to the formation of the combinations of railroads commonly known as pools, the

methods in which they are managed, the effects such combinations have on tariffs, and other details. The objects leading to the combination of the railroads, he said, were largely the same as those which compelled the government of this country to regulate affairs between the states. Underlying the organization was, too, the same principle which prompted the formation of trades-unions—self-protection. The latter organizations could therefore be no more justly attacked when they adhered to their principles than the former.

Mr. Fink personally favored any combination of citizens or corporations which subserved the interests of the organizers without injury to the public at large. The experience of the world had shown the benefits to the public of a combination among railroads. This was shown in Belgium and France by government control of these properties. Combination proved beneficial to shippers—first, in the establishment of through lines and the adoption of through bills of lading. Before that the cost of transfer from one road to another and the imposition of local tariffs made it impossible for a shipper to know what his freightage would cost unless he went to the trouble of making a number of contracts with carriers and transportation companies. Now a rate to any point could be ascertained at any point, and when no war was in progress that rate was unvarying. These combinations could not exact unjust or undue rates from the people, because of the nature of things, and in fact the rate was fixed in a measure not by the line having the greatest advantages, but by that which could afford to charge the lowest tariff. That the tariff could not be made exorbitant or more than the traffic would readily bear was insured by several facts: the influence of water-ways as competitors for traffic, the necessity of fixing rates so that shippers might be able to make some profit on the basis of prices established in the markets of the world, and the necessity of enabling producers to reach markets with their products so reasonably that they might fairly compete with producers in other sections or countries. No combination of water lines similar to the railroads was had because rival lines would spring up and cut the rates, and there was no possibility of a monopoly in this business. Because of the facility of water communication with all parts of the country the eagerness of railroad companies to secure business in connection with such lines and the necessities of carriers enabling producers to compete in the markets, there could not be, under any circumstances, an unreasonable tariff established.

Combination and competition among carriers for the benefit of the people, Mr. Fink said, had reached its highest state of perfection in this country. In proof of this he stated that the freight charges in this country were cheaper than in any other country in the world. In 1880 the average tariff per ton per mile was 9-10 of 1 cent in this state; in Belgium 1.65 cents; in France 1.5 cents; and in Prussia nearly 2 cents; in England it cost as much to carry dressed beef from Glasgow to London as it did to transport it from Chicago to New York—double the distance. The entire railroad system of this country, including actual outlays, bonds, stock, watered stock, rolling stock, plant, and complete equipment, capitalized at \$7,000,000,000, consisting of 112,000 miles, cost \$80,000 a mile and could not be duplicated for that money, as that did not include the money wiped out in bankruptcy proceedings. Italy's system cost \$90,000 per mile, Germany's from \$100,000 to \$140,000, and England's \$200,000. The exceptional cost of European roads is the additional expense incurred in labor and equipment, and the unnecessary expenditures for bridges, aqueducts, buildings, etc. Taken as a whole, the system of this country earned only 3 per cent. on its stock and 5 per cent. on its bonds and no road to his knowledge paid more than 10 per cent. dividends. The gross receipts last year were \$700,000,000; the operating expenses, \$400,000,000; the net receipts, \$300,000,000; and the amount paid in dividends, \$100,000,000. To earn this money the rates charged on a barrel of flour between this city and Chicago, the basis on which all rates were fixed, was only 50 cents, and only 33 cents on 100 pounds of beef, so that for \$2 the entire amount of flour and beef needed by a single person was brought to him from the farms of Illinois. The tariff on a suit of clothes was only 7 cents; on a silk dress 1/2 cent; on a pound of coffee 1-3 cent, and on a pound of sugar, 1-4 cent. These were certainly not exorbitant rates, Mr. Fink argued. The trouble about freight rates among consumers was due to a misunderstanding of the situation and to the fact that the middleman and the retailer not only charged their profits to consumers, but pocketed what they could make from freight rates.

With Senator Blair Mr. Fink had a long discussion as to what were reasonable charges, the latter holding a reasonable charge for freight handling to be one that was as low as by the lowest possible competitor—water transportation. With a charge based on that standard he held that no dividend could be rightly called an excessive one, no matter how large it might be. Senator Blair held that no road should be allowed to earn more than 10 per cent., not on the amount actually invested, but upon the present value of the road, even if it had been through bankruptcy or run a quarter of a century at a loss. Mr. Fink held that the state had no right to limit dividends, as long as only reasonable charges were made, unless the state agreed, as is the case in France, to pay to the projectors all losses incurred while the road was being developed. He denounced the Reagan bill, which has been before Congress so long, as impracticable and ridiculous, and a measure which could never be carried out in a government like this. Its enactment, with its cast-iron basis of rates, would kill off a majority of the roads and build up a few, and would strangle the healthy competition which is the safeguard of the people. While he would approve of some government legislation which would charter and give power to enforce agreements and so stop rate-cutting and unhealthy and dishonest competition in such combinations as now exist, he did not think the country ready for it, because the people had a misconception of the system. He thought laws should be enacted to prevent speculative men from building roads, bonding them to their full value, and then, floating the bonds, making to purchasers a present of an amount of stock equal to their bonds—a system pernicious and ruinous. He thought it would be a good thing to pass a law compelling every railroad which establishes and publishes a rate to stick to that rate. This would tend to prevent wars, be a guarantee to stockholders in a measure, and be of advantage to shippers. Railroads never had been a paying investment, and the laws had been one-sided regarding them in that the people and the country had been insured a benefit whether the stockholders derived any or not. Both classes should be equally and in all ways protected. Had such a combination of roads existed as there is at present, with the law he suggested, no monopoly like the Standard Oil Company ever could have existed. It was an outgrowth of unhealthy rivalry between the trunk lines to get business, and the people generally were the sufferers. Now the company, with its pipe lines, was free of the railroads, its own carrier, and the roads were the sufferers. State railroad commissions, as advisory and supervisory bodies, he thought, were a good thing, the only defect being that their powers could not extend beyond the limits of their respective states. He thought such a board exceeded its usefulness, however,

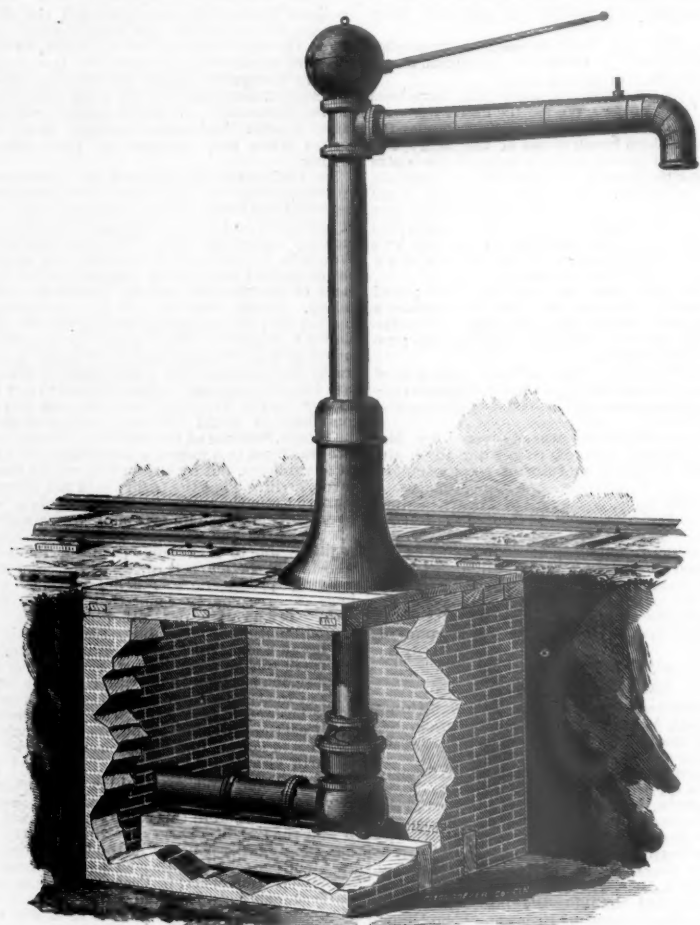


Fig. 1.

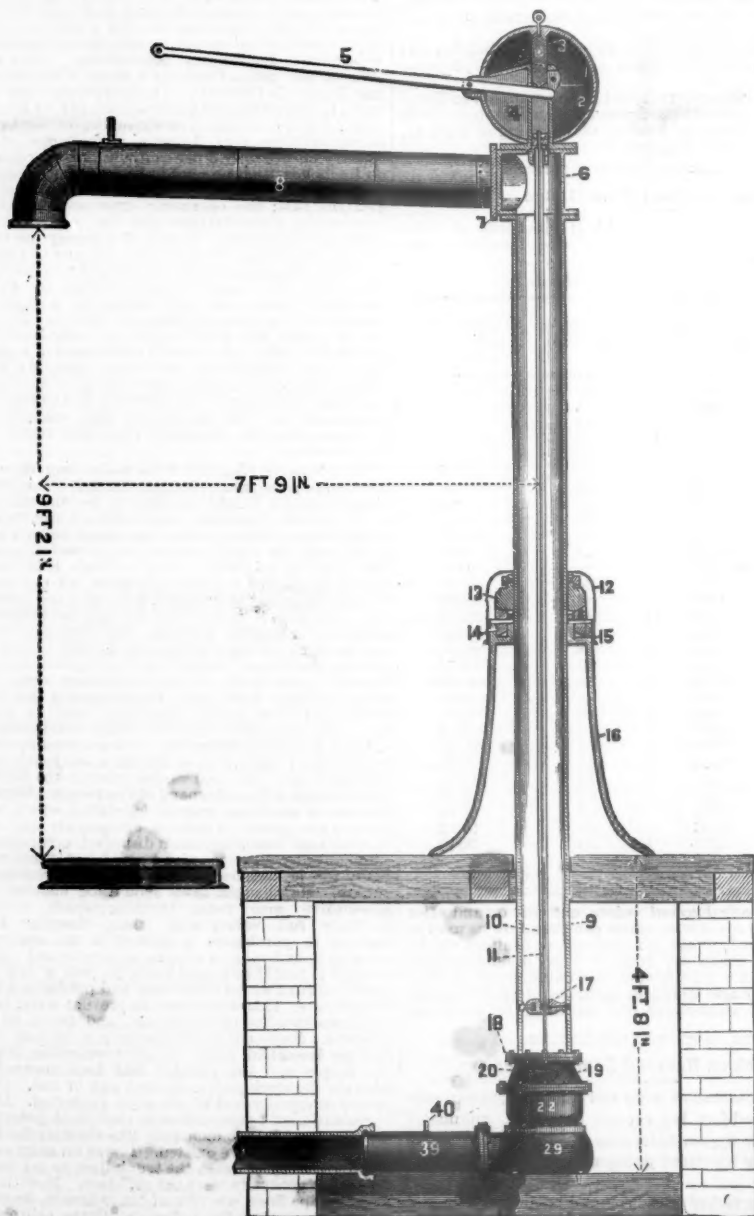


Fig. 2.

POAGE'S AUTOMATIC WATER COLUMN.

when, as in Georgia, a commission established tariff and classification without regard to the conditions existing on a particular line, and without responsibility to stockholders—a system that might work grievous wrong under the sanction of the law. Although the country had now more means for transportation than there was work for the carriers to perform, he thought railroad extension would continue for some years to come, particularly in the new and as yet undeveloped country.

Poage's Automatic Water Column.

Fig. 1, 2 and 3 in the accompanying illustrations represent a perspective view of a water column, or water crane, for supplying locomotive tanks with water, which was exhibited at the Chicago Exposition of Railway Appliances, and which is extensively used on different railroads of this country.

The automatic feature consists in supporting the column on rollers and inclined planes, so that when the discharge spout is moved at right angles with the track, and communicates with the tender, the column is raised up, and when the spout is released it will be turned automatically by the weight of the column, so that the spout will always stand parallel with the track, when not in use, and thus be out of the way of passing engines.

The mechanism by which this is effected is shown, although somewhat imperfectly, in fig. 2. A collar 13 is attached to the vertical column 9. The under side of this collar, forms what may be called circular inclined planes, and these rest on rollers 14. As the column is turned the inclined planes roll up on the rollers and thus raise the column. Each inclined plane occupies a quarter of the circumference of the collar, so that when the spout 8 is turned from a position parallel with the track to one at right angles to it, the inclined planes move on the rollers 14 from their highest to their lowest points. When the lowest points on the inclined planes rest on the rollers, then the column is raised up highest and if released will then roll down by its own gravity and thus turn the spout as already described.

The main valve, by which the water is admitted to the column from the supply pipe 39, is contained in the chamber 29, figs. 2 and 3. It consists of a cylinder 32, open at both ends and which rests on a rubber seat 36, and works in a leather packing 30 around its upper edge. The cylinder has interior arms 33, 32, with a hub or boss in the centre, to which a rod 31 is attached. This is connected by a coupling 23 to the rod 11, and that in turn to the lever 5, shown in fig. 2. The end of this weight is loaded by the hollow ball 1, 2, to insure the seating of the valve, but in order to prevent any shock or jar from that cause a cylinder 25, with a piston 26, fig. 3, are provided above the valve 32. The piston is connected to the valve-stem or rod 21, so as to move with the valve 32. A small valve 27 is attached to the piston so that when the main valve 32 is opened and the space around and above the cylinder 25 is filled with water it will flow through the valve 27 and fill the space in the cylinder below the piston. As soon as the piston moves downward the valve 27 is closed, and then the only way in which the water below the piston can escape is through an opening whose size is regulated by an adjusting screw 28. As the water below the piston must escape more or less slowly, the descent of the piston and the movement of the main valve 32 will also be slow, and thus any shock or jar is prevented.

To prevent the water from freezing in the column in winter, a waste-valve 32 is provided below the main valve. This waste-valve is closed when the main valve is opened, and vice versa.

But even with this waste valve there is danger that the rod 11, fig. 2, will freeze fast while the column is in use. To avoid this it is inclosed in a pipe 10, which is connected to a "bridge" 17, shown more clearly in fig. 3. This bridge has a brass bushing at C which fits the rod 11 closely. The bridge has a drain hole communicating with the outside of the column at B, so that any water which leaks into the pipe at C escapes at B, and thus prevents any water from coming in contact with the rod 10 above the pit.

These water columns are manufactured by John N. Poage, at Court and Harriet streets, Cincinnati, Ohio.

Contributions.

Old and New Frog Angles.

TO THE EDITOR OF THE RAILROAD GAZETTE:

The frog angle, as at present calculated, is to the proportion of one-half to the number. This angle is doubled, and termed the angle of one to the number. The reason of its being calculated in this way is due to the old-fashioned frogs, which were made so that the perpendicular distance from the heel or base to the point would equal the number, and the heel equal one foot; hence the so-called proportion.

This custom of knowing frogs by numbers has led engineers to their improper use, in so far that the proportion calls for a different angle than that of the frog. A little study of the two angles will prove itself. However, it is well-known that our senior engineers had the great convenience in view of simplifying the characters of the different frogs by the adoption of the described system. But now frogs are more or less constructed of rail, and are in length according to the angle, or requirements of the splices; and it is very forcibly impressed on me that there is now no reason why we cannot have the frog angle to represent the true proportion of one perpendicular to the number.

The difference, however, is of no practical importance; but by having the angle as just stated, both number and

angle can be correctly used, and greatly facilitate the calculations connected therewith.

Should there be any reason further in favor of the old frog angle, I hope some one will be kind enough to point the same out.

A. MORRISON, C. E.

A Railroad with a Grade of 2,700 Feet per Mile.

CLIFTON, Arizona, Sept. 9, 1883.

TO THE EDITOR OF THE RAILROAD GAZETTE:

In your issue of Aug. 31 I notice an article headed "The Boldest Railway Yet Constructed" from a correspondent of the *London Times*.

I think I have just completed one for the Arizona Copper Co. that very nearly, if not quite, equals it. The length of the track is 3,000 ft., with a grade of 1,100 ft. The track is laid with three rails, with turnout in centre. It works by force of gravitation; the loaded car down hauls the empty car up, and we have been running two loaded cars down and hauling up two loaded with 1,500 lbs. of iron rails.

The cable is $1\frac{1}{4}$ -in. steel wire. Machinery consists of two grip pulley wheels and two plain wheels, with band brake attached to grip pulley wheels. I have also constructed for this company two other inclines—one 1,500 ft. long, with a grade of 700 ft., and one 1,200 ft. long, with 580-ft. grade.

The company also has seven miles of main track running from Clifton (where their smelters are located) to the foot of the Coronado incline (the first spoken of), passing en route the celebrated Longfellow, Queen and Metcalf mines. Gauge of all tracks, 20 in.

A SUBSCRIBER.

Delays to Cars in New England.

BOSTON, Mass., Sept. 10, 1883.

TO THE EDITOR OF THE RAILROAD GAZETTE:

As you have been interesting yourself in the detention of cars in New England, I want to call your attention to the trouble we are laboring under at present. There are a great many cars arriving daily for the tanneries, and there are many which have been standing on side-tracks for over a month loaded with bark, which is being rushed in here by shippers in order to get pay for it promptly, and just now there is no great demand for it.

We being unable to demand demurrage, the tanners care little how rapidly it comes in or how long it remains in the cars. If there was a demurrage charge the tanners would arrange to have it arrive as wanted, or unload promptly; and as it depreciates by handling, it is an impossibility to force them to unload now. For example, at one station in this state there is enough bark standing consigned to one tanner sufficient to last him three months, provided even no more should arrive. At another station two cars were unloaded the 8th inst. which have been standing there since last July.

Coal cars are in great demand at this season, and instead of always a prompt return, I find at seaboard points our cars are utilized to load for interior points from vessels in order to save demurrage charge, thus delaying our cars from one day to a week or more, according to handling at stations.

I believe no road complains when cars are made to do service on their way home, provided there is no unnecessary delay; but in this country it is not looked after as promptly as it might be.

It seems unfair that our cars should be put into local service here simply to save the roads using them from paying coal vessels demurrage charges.

A Graphic Train Sheet.

TO THE EDITOR OF THE RAILROAD GAZETTE:

Having noticed in recent issues of the *Gazette* suggestions for what may be called graphic train sheets for the use of train dispatchers, I offer an idea that has occurred to me, hoping that it may aid these men in their delicate and responsible work.

The ordinary roll profile paper used in railroad construction affords at once a simple means of making a graphic train-sheet on which the movement of every regular and wild train may be marked in such a way that their position may be seen at a glance at any hour of the day. Take a section of this paper—Plate E will be the most convenient—long enough on a scale of four miles to the inch, horizontal measurement, to represent the division of the road to be operated. Mark each station at its proper distance from the initial point at the left-hand side of the sheet by vertical lines drawn across the sheet, and mark the names of the stations on them. Thus a station eight miles from the starting-point would be represented by a line drawn two inches, or eight spaces of the profile paper, from the initial point. Draw horizontal lines across the sheet every twenty lines of the paper, or two-thirds of an inch apart. These spaces will represent hours, and each smaller space will represent three minutes of time. Mark these lines with the hours of the day from midnight to midnight.

The sheet is now ready for use, and we have the means of representing graphically both time and distance, time running downward and distance across the sheet, and the movement of trains consuming time and making distance will be represented by diagonal lines; up trains by diagonal lines from upper left to lower right-hand sides of the sheet and down trains by diagonal lines from upper right to lower left-hand sides of the sheet. Lines representing trains running in different directions will approach each other till they meet and cross at a station, if properly timed, or showing if they would meet between stations that a collision would take place. Passenger trains may be shown by red lines and freight by blue

lines. Draw on first lines representing the regular trains of the time-table in the following manner: Thus, suppose we have a train starting from the beginning of the road at one o'clock a. m. Make a dot at the intersection of the one o'clock line with the initial station, or, say station A. The next station of the time-table is B, which is reached at 1:30. At the intersection of station B line and the 1:30 line make another dot. Station C may be reached at 2:30. Make a dot at the intersection of these lines; and so continue with every station the train is timed at. Where the train remains at a station any perceptible length of time, there will be two points connected by a vertical line. Mark these points till the train has traveled the 24 hours or left the division, and connect the dots by lines. Do the same with each train on the time sheet, remembering that up trains will be represented by lines drawn diagonally downward from left to right and down trains diagonally downward from right to left. The sheet then will be a graphic time-table of the regular trains. Ink these lines in colors as stated. Should an extra be ordered out, its proposed course may be drawn in the same way in pencil, which may be rubbed out at the end of the day. In drawing its course it will be seen at once where it will meet the regulars or other extra trains, and its time may be advanced or retarded to pass other trains at convenient points. Should any train be disabled on the road, as soon as reported place a pin with a bit of red silk or paper at the point till it is ready to resume its journey, when a course may be marked out for it in pencil as on irregular trains.

It may be that I have not made the description sufficiently plain for the ordinary operator or train-dispatcher, but I think any draughtsman or civil engineer will understand the method and be able to instruct an operator, so that he might use it easily and prepare the sheets without difficulty.

Time-tables may be prepared in this way much quicker and with less liability to error than by the ordinary method of calculation, as, by drawing the course of the train down the sheet at the proposed rate of speed, the time of passing stations will be read off without any calculation. The regular time-tables may be drawn in this way and photo-lithographed or reproduced in any way, and used in the place of time-tables. Engineers and conductors would soon learn to read the time from them as readily as from a time table, and it shows when and where other trains are to be met far plainer than the ordinary time-table.

KEITH.

[This is substantially the method Mr. John M. Goodwin proposed in these columns recently, and that by

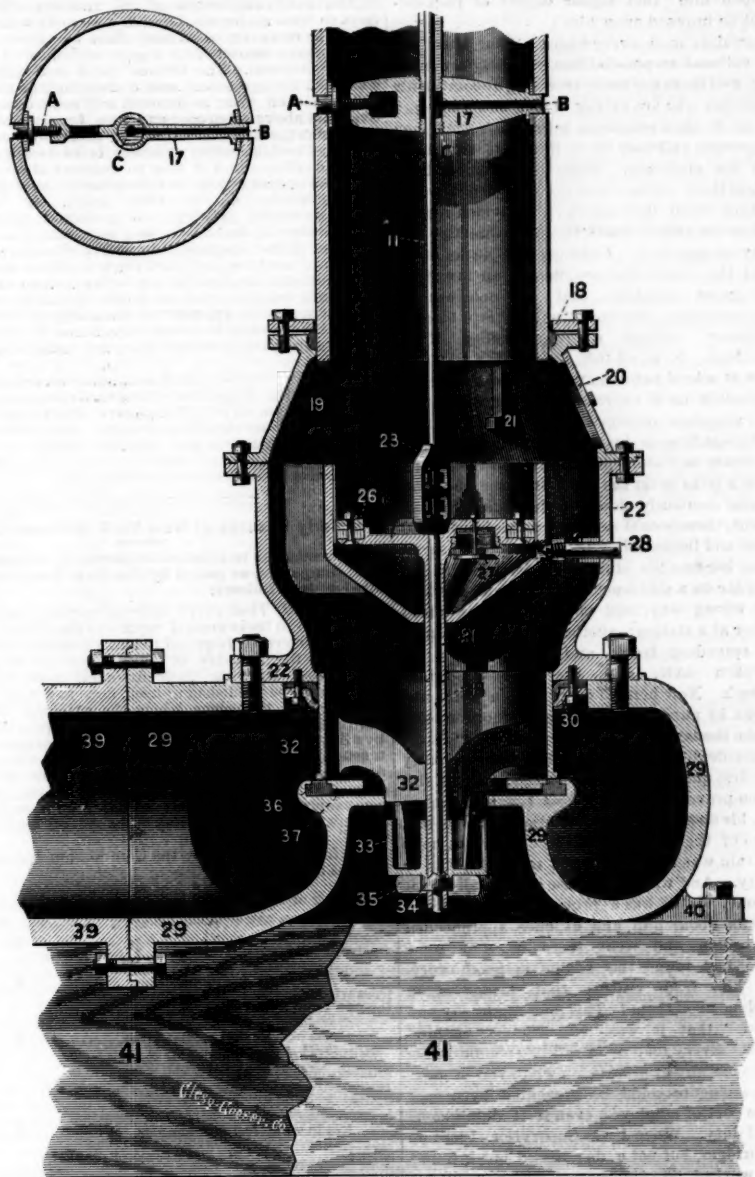


Fig. 3.

POAGE'S AUTOMATIC WATER COLUMN.

which time-tables are made; the great time-table board being nothing more than such a sheet with facilities for changing the position and direction of lines easily and quickly. It seems that those who are most impressed with the desirability of making the position of trains readily intelligible to train-dispatchers at a glance by means of a board or a diagram are, without exception, we believe, not train-dispatchers. The latter are likely to claim that the ordinary train-sheet is to them as plain as a diagram; and doubtless it does convey to them a realizing sense of the actual condition of things which it does not to others. Nevertheless, blunders are sometimes made which would seem impossible if the dispatcher saw on his train-sheet what he could hardly help seeing on a diagram or board.

Mr. Thomas Appleton thinks that some of those who have discussed his proposition lose sight of what he considers an important point, namely, that the shape of his proposed dummy indicates its direction at once, and shows impending danger.—EDITOR RAILROAD GAZETTE.]

The Qualifications of Road-Masters.

NEW YORK, Sept. 17, 1883.

TO THE EDITOR OF THE RAILROAD GAZETTE:

I desire to inflict upon you my conviction of who is the proper man for road-master and supervisor of track, deduced from the several letters appearing in your *Gazette*, and from long experience as a civil engineer and supervisor of track. Judging from the numerous and varied formulas that have been brought out as necessary in laying out a correct switch, it would at once become apparent that the laboring man, who has been through all the lower details of track with the pick and shovel, is not the man. It must have become evident to your readers ere this that the proper man should be one instructed in all the details of trigonometrical calculation. Now, isn't it evident that the proper man is the engineer, who has laid out the road and superintended its construction in all its details to its finishing off? Isn't his practice of a superior order and does it not excite a deeper discernment into the necessities surrounding him than the laboring man's duties? Wouldn't a general manager in selecting his subordinates prefer a civil engineer to fill these places than one whose untutored mind would

not impress upon him that higher degree of responsibility that might be imposed upon him?

There are worthless men everywhere. Some men are competent for railroad responsibilities, and they are intelligent naturally, and there are many receiving appointments in different capacities who are totally unfit, and improper discrimination as to their education is the cause. All men do not make engineers, and they often find that out themselves and quit the profession. Some men are unfit to be railroad men, and these neither time nor experience would ever benefit. Many retain their places from divided responsibility which does not attach itself to them directly, and feeling none they assume none. Outside of the duties of the road-master and the supervisor, we find in an investigation of some great accident, that no one has assumed any responsibilities, therefore "nobody is to blame." Some men cannot assume a responsibility if it is imposed upon them. Now, all this, I claim, is a want of a proper education at school before entering upon a railroad. There is not a position on a railroad, however small, that does not have its attendant responsibilities, and every man should keep his thoughts upon his peculiar duties, and contribute so much less to any accidents breeding in the future. If each man upon a train or on the track or in the shop was a thinking man and studiously closed up the gaps in his particular department, there would never be an accident. That may seem strange and impossible. Let us see. We hear of a fearful accident, because the station agent failed to put on the brake of a car on a side track; another from a switch being turned the wrong way, and one train running into the rear of another at a station; another is ditched from a broken rail or spreading track, and how often is recorded the broken axle, and the last a bridge blown into the creek. Now here in every case a train and life is endangered by pure thoughtlessness, ignorance and carelessness. Take the latter case, which is laid to "Providence." If this accident, like all others, had been properly investigated, the first question might be asked: "Could this accident have been prevented?" We find the agent close by at the station, his doors blown in and other damage, and he, comprehensive of the fact that a severe gale was upon them, knew the train was nearly due, and made no effort to avert this calamity. And why? Because he is totally unfit to be a railroad man. If he was a proper person, he would have had lively wit about him and at once apprehended danger to that bridge and went there or sent some one. Suppose he had found the bridge in good order, should it deter him from visiting that bridge again with the next cyclone upon them? This man might say and console his mind "that it was no business of his." It was his business. Every man on a railroad should make it his business if he has any apprehension whatever of danger. Many more accidents could be prevented by proper surveillance on the part of employees, even if it didn't come under their special duty. When I was Supervisor, I had no supervision over bridges, but not a day passed but I found bolts loose, nuts worked off, ties spiked which were not bedded to the stringer. I reported them at once to higher authority, and the bridge foreman was notified at once, and perhaps a great accident avoided.

There is no position a man can hold on a railroad without thought, and thinking all the time while on duty; and one careless, thoughtless man on the track is contributing his mite toward some casualty to future trains.

When I was Supervisor of Track, I always impressed it upon the section foreman to teach his men to watch every rail and every spike, whether riding on a hand-car or walking upon track. And I always made it a point to express approval of work *done well*, to the foreman and the men. It gave me pleasure to do it, and it encouraged the men. It should be the duty of every man possessed with authority over others on railroads to apprise them of the fact that they can do nothing well but what it is observed and noted, and in proper terms of encouragement tell them so. My experience among men on public works has been that proper encouragement has made them strive one to outdo the other. It causes men to have pride in themselves, and a continual thought of approval from headquarters is looked for, and their duties in every respect better performed.

Your readers can form some idea of what I deem a proper man for railroad work, and who should perform the executive duties over track. The educated man has got his place on the road and the laboring man his; so let them remain. There is no use of trying to foist into the office of road-master a man whose only recommendation is *practice*. Brains, and educated ones at that, and knowledge of his duties only are fit for that place. A man who is not afraid to avert a calamity, even if it does not come quite under his supervision—a man who understands his duties, both theoretically and practically, and thoughtfully attends to them, is the fit man for the position of road-master and supervisor of track.

W. GRISWOLD, C. E.

Income Bonds.

The income bond is generally a delusion. It seldom pays any income, and is a thing made only to sell. There is a pleasant sound about its name that is attractive to "lambs," and this helps the original maker to get it out of his hands—but afterward there is little hope. Out of some fifty different issues of income bonds on the New York Stock Exchange list how many have paid any interest in the past two years? And unfavorable as these years have been for stock speculation, they have not, upon the whole, been a bad time for railroad earnings. The income bond is a delusion in professing to be what it is not—first in offering the holder some probable hope of income, and secondly in pretending to have some security as a bond. In the first regard, it is next to impossible to get railroad managers to look with any respect upon an income bond; they have so long been accustomed to treat it with indifference as a thing having no fixed

rights, that to expect one of our railroad officers in these days to treat an income bond as a security with legal rights would be more extraordinary than to expect a Mississippi man to have respect for a negro, or John Bull for a copper-colored Oriental. The income bond is usually issued and sold with the agreement and understanding that it shall receive in each year, as interest, any net income of the road over and above all proper expenses for operating and interest on mortgage bonds. But the precise nature of the net earnings and operating expenses is so loosely defined that railroad officers find it easy to consider almost anything as expenses proper enough to take precedence of the interest on income bonds. On the other hand, the bonds seldom carry a voting privilege, as preferred stock does, and are therefore useless in exerting any control over the management of the company. In nearly all cases where income bonds are issued a preferred stock would be much better, as the rights of a stockholder are better defined at law; and if it is really intended that the holder should have a claim on income next after the interest on mortgage bonds, the preferred stock should be made cumulative in terms so plain and so strong that no court of equity could refuse to enforce the privilege.

Let income bonds and all anomalous securities be abolished, and let the obligations of railroads be brought down to the well-known forms of ordinary stock; preferred stock with rights must clearly be defined; plain debenture bonds with an obligation to pay regular interest on them; and finally, mortgage bonds with a specific lien on the property. —Commercial and Financial Chronicle.

Quarterly Returns of New York Railroad Companies.

The resolution in relation to quarterly returns from railroad companies, as passed by the New York Railroad Commission, is as follows:

"Resolved, That every railroad corporation in the state, in addition to their annual report to the Board of Railroad Commissioners, be required to make quarterly reports beginning with the first day of July, upon forms provided by this Board, showing their financial condition, and that such report be published at least once in a daily newspaper published at the place where the principal office of such railroad company shall be; and such report shall be made by all railroads and railways, and the corporations, receivers, trustees, directors, or others, owning or operating the same, and also by all sleeping and drawing-room car companies or corporations, and by all other associations, partnerships, companies or corporations engaged in transporting passengers or freight upon any railway, or lessees, or otherwise."

The form prescribed by the Commission for making these returns is as follows:

STATEMENT OF THE EARNINGS, OPERATING EXPENSES AND NET INCOME FOR THE QUARTER ENDING.....188	
Gross earnings.....	\$.....
Operating expenses.....	\$.....
Net earnings from operation.....	\$.....
Operating cost..... per cent. of earnings.....	
Income from other sources.....	\$.....
Gross income from all sources.....	\$.....
Deductions from income as follows:	
Interest on funded debt.....	\$.....
Taxes.....	\$.....
Rents.....	\$.....
Net income from all sources.....	\$.....
GENERAL BALANCE SHEET.	
Assets.	
Cost of road and equipment.....	\$.....
Stocks and bonds of other companies.....	\$.....
Other permanent investments.....	\$.....
Due by agents and others.....	\$.....
Supplies on hand.....	\$.....
Cash on hand.....	\$.....
Sundries.....	\$.....
\$.....	
Liabilities.	
Capital stock common.....	\$.....
Capital stock, preferred.....	\$.....
Funded debt.....	\$.....
Loans and bills payable.....	\$.....
Interest on funded debt due and accrued.....	\$.....
Dividends unpaid.....	\$.....
Due for wages, supplies, etc.....	\$.....
Sundries.....	\$.....
Profit and loss.....	\$.....
\$.....	

The return must be verified by the oath of the proper officer of the company making it.

The Decision on the Vermont Central Compromise.

The suit which Mr. Rowland G. Hazard, of Peacedale, R. I., brought in the Supreme Judicial Court of Massachusetts last spring, in which the Consolidated Railroad Co. of Vermont, the Vermont & Canada Railroad Co. and the American Loan & Trust Co. are defendants, has been noticed heretofore. Judge Field granted a preliminary injunction restraining the Trust Co. from issuing more bonds; but he suggested that, as the real controversy was in reference to the construction of the statute of Vermont, under which the compromise of the difficulties was to be made, and as the courts have no jurisdiction over the courts of Vermont, a suit should be brought there, and the dissolution or continuance of his injunction should depend upon the result of the hearing there. Accordingly, Mr. Hazard went before the United States Circuit Court for the District of Vermont and asked for an injunction upon the same grounds which he set up in Boston. The hearing took place before Judge Hoyt H. Wheeler. Messrs. Elias Merwin, of Boston, and W. L. Burnap, of Burlington, argued in behalf of Mr. Hazard; Mr. H. D. Hyde, of Boston, in behalf of the American Loan & Trust Co.; and Senator Edmunds and the Hon. B. F. Field, of Montpelier, in behalf of the Vermont & Canada. Judge Wheeler filed an opinion refusing an injunction and holding that the compromise is legal and valid. The full text of his opinion, which recites in detail the various questions raised, is given below.

Rowland G. Hazard vs. Vermont & Canada Railroad Co., Consolidated Railroad Co. of Vermont, American Loan & Trust Co., in equity.—This is a motion for a preliminary injunction to restrain the defendant, the American Loan & Trust Co., from delivering \$1,000,000 of bonds of the defendant, the Consolidated Railroad Co. of Vermont, to the stockholders of the defendants, the Vermont & Canada Railroad Co., and has been heard on bill and answers. According to the bill the property and franchises of the Vermont Central Railroad Co. primarily, and those of the Vermont & Canada Railroad Co. ultimately, were

subject to \$5,357,000 of liabilities, which the property of the Canada Co., after exhausting that of the Central Co., was more than sufficient to pay; the Consolidated Railroad Co. of Vermont has succeeded to the property, franchises and liabilities of the Central Co., and issued \$7,000,000 of bonds secured by mortgage of its roads and property to the American Loan & Trust Co. as trustees for the bondholders, to further secure which a mortgage of the roads and property of the Canada Co. has been executed, and the bonds delivered to the same trustee, to be used, \$5,357,000 of them to retire the liabilities mentioned; \$1,000,000 of them in exchange for the stock of the Canada Co., which amounts to \$3,000,000, at one-third its par value, and the balance \$643,000 of them for purposes not disclosed, contrary to the interests and rights of the stockholders of the Canada Co., of whom the orator is one.

The answers set forth that the property and franchise of the Central and Canada companies were subject to a further liability of \$643,000 to the Central Vermont Railroad Co.; that interest overdue on the \$5,357,000 amounted to \$2,300,000, making in all \$8,900,000, which was more than the value of the property, and subsequently to an annual rent of \$240,000 to the Canada Co., of which \$2,640,000 was overdue; and that by way of concession and compromise the security-holders had agreed to forego the interest due them, and exchange their securities for these bonds at par, and leave \$1,000,000 of the bonds for the Canada stockholders, equal to one-third of the par value of the stock, in place of all claim for rent past or future; which was agreed to by the Canada Co. in its corporate capacity, and stockholders individually of \$2,700,000 out of the \$3,000,000 of stock; and that the mortgage of \$7,000,000 was as large as the property would bear, and the arrangement advantageous instead of detrimental to the Canada Co. and stockholders; and that a surrender of the stock in exchange for the bonds was an incidental requirement for carrying out the compromise, and not any substantial part of its consideration.

Those parts of the answers that show the consideration of the bonds and mortgages, their adequacy to the value of the property, and the purposes for which the bonds are intended to be delivered to the stockholders of the Canada Co., are directly responsive to those parts of the bill that charge want of consideration in part, an excess of property belonging to the Canada Co., and a fraudulent purpose toward the interests of that company and the minority of the stockholders, and must be taken to be true upon this motion, while those parts in avoidance are not to be so taken.

The question raised upon this motion is not affected in any way by the bonds themselves, for they are the bonds of the Consolidated Co. only, and the Canada Co. is not a party to them, nor by the mortgage of the Consolidated Co., which covers only its own property, but relates only to the validity of the mortgage of the Canada Co. as against the rights of its stockholders as secured for this \$1,000,000 of bonds intended for them.

It is claimed to be invalid, on the ground, principally, that it is outside of the corporate power of the Canada Co., as granted to it by its charter and the laws of the state.

The road of the Canada Co. was an extension of the line of the Central Co., and the lease of it to the latter was made before it was completed, and was perpetual, without clause of re-entry for nonpayment of the rent.

At that time there was no statute dispensing with a stipulation for re-entry in ejectment for nonpayment of rent, as there is now, first enacted with the General Statutes of 1863. (Comp. Stat. 284 § 14, Genl. Stat. 339 § 14, Rev. Laws § 1259.) The lease was held operative, and the road passed in perpetuity to the Central Co. And while matters so remained the Canada Co. had nothing in respect to the road but the right to recover the rent of the Central Co. Afterward an agreement was made that upon default in payment of rent for four months the Canada Co. might enter both roads, and take the whole income of them until the rent should be paid up, when the Central Co. might resume possession. This agreement was held operative to entitle the Canada Co. to the income of the roads, but not to their possession, for the payment of its rent, to be reached by receivers of the court. (Vermont & Canada R. R. Co. vs. Vermont Central R. R. Co. 34 Vt. 1.) Thus, as said by Barrett J., in the same case before the court on petition of the receivers to sell the roads to pay the accumulated expenses of the receivership, 50 Vt. 500: "Virtually and practically, under the lease, both roads became a single one in the permanent and perpetual proprietorship of the Vermont Central Railroad Co., and under the permanent possession and control of the Vermont Central Railroad Co., subject to the first right of the Vermont & Canada to the net income to pay rent four months and more overdue;" and by Redfield J., in *Langdon vs. Vermont & Canada Railroad Co.*, 54: 593: "The Vermont and Canada Railroad and the Vermont Central, each having its corporate entity and franchise, were so bound together by mutual and perpetual covenant that they had become one road. The Vermont Central road was the owner of the whole line, including the two roads, subject to certain rights and interests in the property of its mortgage bondholders and the rent claim of the Vermont and Canada road."

"The Vermont and Canada Railroad held and owned the right to a fixed annual rent as a first charge on the income arising from the use of said line of roads, and the right to compel the application of such income in extinguishment of such rents in case they were in arrear."

"The property of the Vermont Central Railroad was its roads and incidents, subject to certain fixed burdens. The property of the Vermont & Canada was a leasehold estate, and susceptible of valuation and alienation like other property."

On questions like these touching rights of property under the laws of the state, these laws, and the decisions of the state courts construing them, have binding force, and govern in the federal courts. (Rev. Stat. U. S., § 721. Nichols vs. Levy, 5 Wall. 433.)

Under these decisions of the state courts, which this Court is so bound to respect, the Vermont & Canada Co. had no railroad to mortgage, either separated from or connected with the road of the Vermont Central, now of the Consolidated Co. The latter company is the proprietor of the whole of this line of railroad property, and the Canada Co. the proprietor of the rent charge upon, or what Judge Redfield calls the leasehold estate in, the income of the whole line. The roads and their property are covered wholly by the mortgage of the Consolidated Co., and the rent charge only is covered by the mortgage of the Canada Co. The question, therefore, is not whether the Canada Co. had corporate power to mortgage its road to raise money to pay rent due to itself for its stockholders, or to pay them for their stock, but whether it has power to deal with this rent by exchanging it for other securities, of less amount, but greater value, for its stockholders. The disposition of the rent and the claim for it in future is the principal thing, for that represents substantially the corporate assets of the Canada Co.; and when that is gone the transfer or surrendering of the stock would be a mere nominal formality. Power to deal with the rent is implied in the power to make the lease and reserve the rent, which it was held the corporations had. (Vermont & Canada R. R. Co. vs. Vermont Central R. R. Co., 34 Vt. 1.) And powers necessarily im-

plied from those expressly granted are as well granted as the express powers. (National Bank vs. Graham, 100 U. S., 699.) Power to lease would include power to fix the rent in money or money securities, which might be done from time to time by modifying it in amount, or by changing it from one security to another. This is what is attempted in effect here.

Again, power for this purpose may be found in another direction. When the Canada Co. was in danger of losing its charter by failure to comply with its conditions, the Legislature made provision for its continuance, but provided also that the original charter and all its amendments should be subjected to the control of the General Assembly, and might be altered, amended or repealed as the public good might require, and for the acceptance of the act. (Laws of Vt., 1859, 85, § 3.) The company proceeded under the act and became subject to it, as it did to the law authorizing leases of railroads passed after the charter was granted, under which this lease was held valid. (Vermont & Canada R. R. Co. vs. Vermont Central R. R. Co., 34 Vt. 1.) This brought the company within the reach of the act of 1882, which provides that: "When two railroads are encumbered by a lien or liens upon the two roads, the company owning either road may issue bonds" "for the purpose of extinguishing such lien or liens, and compromising disputes," "secured by mortgage or mortgages of both roads by vote of the stockholders of the companies owning such roads." (Laws Vt., 1882, 46, § 2.) The rent of the Canada Co., was a lien upon the income of both roads, which encumbered the roads themselves. It was due to the company as trustee for the stockholders. These bonds were to extinguish this lien, and the mortgage to secure them is directly within the terms of the act, if it can operate as a mortgage upon any property at all. When the rent is extinguished the property represented by the stock will be practically extinguished, as before alluded to, so far as railroad interest will be concerned. Its transfer to the Consolidated Co. would not transfer the corporate powers of the Canada Co. over any railroad, to that company; nor extend or curtail the control of the franchises of either, and is not within the principle that one railroad company cannot extend its franchises and privileges by purchasing the stock of another and controlling it. The stock of the Canada Co. represents a nominal security of the roads; the bonds are to extinguish the securities as such, and not for the purchase of the stock as such. The original lease provided for an absolute grant and release of the road in perpetuity at any time after 20 years, subsequently changed to 50, upon payment of an amount sufficient to pay to each stockholder the par value of his stock. The plan now sought to be carried out is in line with this provision, and not a new scheme to crush out any rights of a minority of the stockholders. The corporate powers of the company should be exercised with due regard to the just rights of all the stockholders, and not for the purpose of sacrificing the interests of the minority for the advantage of the majority. This plan does not appear to be prosecuted for any such purpose, but presents the aspect of an honest and fair endeavor to save to these stockholders a remnant of their property, as mentioned by Judge Redfield to be so desirable in *Langdon vs. Vermont & Canada R. R. Co.*, before cited. When this scheme for settlement was begun, there were, besides, the holders of this debt of \$5,357,000, of which \$4,357,000 was bonded, and \$1,000,000 was floating, and the Central Vermont's receiver's claim of \$643,000 and the Canada stock, already mentioned, the first-mortgage bondholders to the amount of, originally, \$2,000,000, and second-mortgage bondholders to the amount of, originally, \$1,500,000 of bonds, on all of which the interest had long remained unpaid, and each class was contending for priority. In the plan some concessions were made by all, and some provision was made for all. That it was, at large, just and fair, is shown by its general acceptance. The consideration for its acceptance by each was its acceptance by the others. When the orator commenced proceedings the Consolidated Co. had been formed by the mortgage bondholders; the Canada rent had been reduced to a nominal sum; the mortgages had been made and delivered, and the bonds had been delivered to the Loan & Trust Co., and some of them to the security-holders entitled to them, so that the scheme could not be abandoned and the status restored.

The Vermont & Canada stockholders all stood together in earnest, with the advantage over bondholders and single creditors of having the power of corporate action. Such as has been taken by the orator's associates does not now appear to be likely to deprive him of any of his legal or equitable rights. The motion is denied.

English and American Railroads.

The English government has published the railroad report for 1882. It appears that the total mileage operated in the United Kingdom during the year 1882 was 18,457—an increase of but 282 upon 1881. The length of lines operated in this country during 1882 was 107,155 miles, against 93,058 in 1881. Accordingly, the construction of new lines has been very slight in the United Kingdom, as compared with this country or France. The idea that the United Kingdom has all the railroads likely to be required is not founded in fact. The United Kingdom is nearly as large as are Ohio, Indiana and Illinois combined, yet these three states have a mileage of 26,743, against 18,457 in the United Kingdom. Consequently we are relatively and absolutely better supplied with railroads than is the United Kingdom. But a majority of the English roads has a double track, which is the exception in this country, save on the main lines.

The English roads are capitalized at £767,899,570, or \$41,605 per mile, against \$6,895,661,359 in this country, or \$61,342 per mile. Therefore, while the United Kingdom has but 17 per cent. of our mileage, its railroads are capitalized at 56 per cent. of ours. In other words, a mile of railroad costs in England 3.2-5 times as much as it does in this country. This is accounted for by better construction and by the greater value of land. But the cost of English roads shows that a certain caution will have to be employed when American railroads are indiscriminately charged with excessive capitalization. Attempts at duplicating American roads at a lower cost than the nominal capital of the parallel lines have been a uniform failure.

The common capital of the railroads in the United Kingdom is £283,574,028, being an increase of 2.8 per cent. upon the year 1881, while the share capital of the American roads was \$3,456,078,196, or \$385,254,585 more than in 1881. For this increase in liabilities we have to show a handsome growth of mileage, which the United Kingdom has not. Its capital per mile has increased £586 in one year, while ours has increased but \$2,393 in two years. Consequently, both countries have been guilty of excessive capitalization, or the popular impressions on this point should be modified. In any event, our railroad system need not fear comparisons, whether technically or financially, provided the point established turns on the public value of the roads, rather than on the dividends paid to the owners. On this latter point our exhibit is not specially excellent.

In 1882 our roads earned 11.2 per cent. on their liabilities,

and the net earnings were 4.5 per cent. The English roads earned 11.07 per cent.; their net earnings were 4.32 per cent. and their dividends were 4.73 per cent. on the common shares. Accordingly, our roads did fairly well, compared with the English roads, except in dividends. For in 1882 our roads paid but \$102,081,434 in dividends on a share capital of \$3,456,078,196, while the interest account swallowed \$149,295,390. The American roads paid less than 3 per cent. to the stockholders, while the English roads paid over 50 per cent. more. In other words, American roads confer greater benefits upon this country than the English roads confer upon theirs.

American roads pay higher rates of interest on borrowed capital than do English roads. English railway bonds amount to about 950 million dollars. Of this amount, about 630 millions pay between 3 and 4 per cent., while nearly 300 millions more pay between 4 and 5 per cent. The larger part of preferred stock pays between 4 and 5 per cent. Of the guaranteed stock, 55 per cent. pays between 3 and 4 per cent. Of common stock, 15 per cent. paid nothing; 21.4 per cent. paid between 4 and 5 per cent.; 18.8 per cent. paid between 5 and 6 per cent.; 13.3 per cent. paid between 7 and 8 per cent.; 11.3 million dollars paid between 8 and 9 per cent., and six millions paid 17½ per cent. In other words, guaranteed interest was so low that the profits of the common stockholders were much higher than with us. Nearly one-half of the railway net earnings in this country is paid out for interest on the bonded and floating debt, while in England a similar proportion goes to the stockholder.

The lesson of this is obvious. The technical part of our railroads is rather better developed than is the financial part. The latter has received all the attention it requires; but this attention has not been employed for the benefit of the stockholders. A stockholder in the minority has been, in this country, a rather helpless person. On the whole, the American bondholder has fared much better than has the stockholder. It is certain that our railroad financiers would do well to show more interest in their stockholders. For it is a scandal, when our railroads earn 4½ per cent. net, that the common stockholders receive, on an average, less than 3 per cent. on their capital, while the English stockholder receives 4.73 per cent., although the net earnings of the English roads are but 4.32 per cent. on the total liabilities.—*Boston Advertiser.*

Caustic Soda Condenser for Locomotives.

Mr. Moritz Honigmann, of Grevenberg, has invented a traction engine, especially intended for use in streets, mines and tunnels, or wherever the absence of noise, smoke and disagreeable gases is desirable. The salient feature of his invention is the use of caustic soda to absorb the exhaust steam, and to liberate a part of its latent heat to be employed in the production of additional steam to drive the engine. If exhaust steam at a temperature of 212° be injected into a solution of caustic soda of a specific gravity of 1.7, the temperature of the mixture will rise to about 374°, while the vapor tension will not exceed one atmosphere. Supposing the hot solution to replace the fire in a boiler, it is evident that a part of its heat will travel through the plates to the water, if the temperature of the latter be lower than that of the solution, and will evaporate a portion of it, and that this action will continue as long as the soda maintains its power of absorbing the exhaust steam without giving rise to any great back pressure. Mr. Honigmann's engine is at work as a tramway locomotive, and will run continuously for five hours with a charge of 500 kilos of caustic soda of 1.7 specific gravity. The following description of its mode of action is taken from our contemporary *L'Ingenieur-Conseil*. Mr. Honigmann's motor has a small boiler, but no chimney. The boiler is a cylindrical reservoir of water heated to a temperature corresponding to the pressure desired, and surrounded with another reservoir filled with caustic soda, either in a state of solidity, or of highly concentrated solution. Now, it is well known that caustic soda is a substance having a great affinity for water, with which it forms a hydrate. In the formation of this chemical combination a considerable quantity of heat is liberated, and Mr. Honigmann has drawn up tables of the boiling points and corresponding effective pressures of different strengths of the solution of caustic soda, from which it appears that a solution of 60 parts of water to 100 parts of soda can absorb vapor at a tension of 7.1 atmospheres, given off by water at a temperature of 167° Cent. (332.6° Fahr.), without in its turn giving off vapor having a greater tension than one atmosphere. It is therefore possible to absorb by means of caustic soda, considerable quantities of exhaust steam without creating behind the piston a counter-pressure exceeding one atmosphere. Suppose, therefore, that the supply pipe of the steam cylinders communicates with the reservoir of water heated, for instance, to 166° Cent. (330.8° Fahr.), and therefore at a tension of 7 atmospheres, and that the exhaust pipe passes into the reservoir of caustic soda, itself heated by the vicinity of the water to a temperature of about 140° Cent. (284° Fahr.), it will follow that as soon the valve is opened the pressure will diminish in the reservoir which contains water and steam; the water will give off a certain quantity of steam, which, after it has done work in the cylinders, will pass into the reservoir of caustic soda; the steam will heat the solution and be absorbed by it, a certain amount of heat being liberated in the process, which will raise the temperature of the solution, and the general result will be that the temperature of the solution will rise, and that of the water fall. The difference becomes constant as soon as the amount of heat returned by the solution to the water, through the partition that separates them, becomes exactly equal to that converted into work in the cylinders. Mr. Honigmann had two thermometers, placed upon his trial engines, on which these variations of temperature could be exactly followed. Suppose, again, that the work done in the cylinders is 300 kilogrammetres (2,160 foot-pounds) per second, which corresponds to 4 horse-power, there will be, according to the mechanical

theory of heat, an absorption of $\frac{300}{424} = 0.7$ calories per sec-

ond. The steam, therefore, which issues from the boiler, parts with 0.7 calorie of its heat in the cylinders, and carries the rest into the solution, and in chemically uniting with the latter, it develops additional heat. Now if the latter quantity be equal to the 0.7 calorie lost, and if the difference of temperature between the water and the solution be such as to permit it to pass through the partition, the temperature of the water will be kept up, and the pressure maintained. This is exactly what takes place if the dimensions of the two reservoirs and the quantities of water and of solution have been suitably proportioned. The full work is obtained from the engine, and all the heat which is not transformed into energy is stored up in the caustic soda, while the water is vaporized without any notable variation in the pressure. An observer placed upon the engine will notice that when the locomotive first starts the pressure falls rapidly for about one atmosphere, and then remains fixed; but if the engine is stopped, it falls a little, and rises again as soon as work is resumed. In order to put the engine in working order again, after the caustic soda

has ceased to be sufficiently concentrated, all that is necessary is to refill its reservoirs with water and soda solution under the original conditions. The moisture absorbed by the caustic soda can be driven off again by evaporation, and the solution thus restored to the necessary degree of concentration. This is done in the central station, where the engines receive their supplies, at an expenditure of 1 lb. coal for every 10 lbs. water evaporated. Compared with other fireless engines, Mr. Honigmann's is exceedingly economical. The author of the article from which we quote estimates that in order to do the same work an engine on the best system now in use would weigh 10 tons 16 cwt., where one of Mr. Honigmann's would weigh only 4 tons 18 cwt. ■

Instructions to Section Foremen and Bridgemen.

The following are the instructions issued by Chief Engineer H. F. White to the section foremen and bridgemen on the Burlington, Cedar Rapids & Northern Railroad:

INSTRUCTIONS TO SECTION FOREMEN.

1. You will be held responsible for tools, material and condition of the road-bed on your section. The whole length of your section must be examined at least once every day, and as much oftener as the season, weather, or condition of the road may require.
2. You will examine rails, spikes, cross-ties, fences, crossings, frogs, head-blocks, cattle-guards, bridges, culverts, and see that the track is in good line and surface. You will also note condition of telegraph line, make all possible repairs where needed, and report breaks to station agent.
3. You must keep a watch in good running order. You must see that all employes devote themselves to the company's service during the regular working hours of the day, and must have a time-card to inform yourself about the time of trains, and be fully informed in regard to rules and regulations of trains and be governed accordingly.
4. You must not, under any circumstances, absent yourself from duty without permission of your Road-Master, except in cases of sickness, and then you must send due notice to the head of your department.
5. You must obey promptly all instructions you may receive from persons placed in authority over you, and conform to all the regulations of the company.
6. All occurrences which may come to your knowledge bearing upon the interests of the company are to be communicated to the head of your department promptly. Any omissions in such matters will be construed as neglect and indifference to the company's interests.
7. Blanks sent you must be filled out in full with information called for and according to instructions. Inquiry should be made at once about anything you do not fully comprehend.
8. No one will be employed who makes a habitual or frequent use of intoxicating liquors, neglects duty, is guilty of misconduct or incompetency.
9. You must work with your men personally, and must require laborers to faithfully perform their duties, and for the full number of hours paid for.
10. You will keep an accurate account of all material and tools received, and report on regular blanks (tool reports) to Road Master monthly.
11. You must keep your hand and push cars in good working order and properly oiled. They must be lifted off the track when not in actual use, and must not be left on a highway crossing in a position to impede travel, and must be locked at night.
12. All cuts are to be well ditched, so as to pass the water freely, and thoroughly drain the road-bed after heavy rains. Material should not be placed where it will be washed into the ditches.
13. The direction of ditches should generally be parallel with the rails, and diverging from them at the lower ends of the cuts, and carried a safe distance from the track, to prevent any washing of the embankment.
14. All material taken from cuts and unloaded over the banks must be leveled off, so as to allow complete drainage of water from under the ties.
15. Ditches, box culverts, bridges and abutments must be examined and cleared of all drift and obstructions after every rain.
16. Each section must be ballasted and surfaced once in two years, one-half being done each year.
17. When a slide occurs, proper signals must be put out and the facts reported at nearest telegraph station.
18. Ties must be laid in track at right angle to the rails, and all must be uniformly spaced. When surfacing, any previous improper spacing is to be corrected.
19. Ties should be assorted, and those of the same or nearly equal size put together in the track.
20. The ends of cross ties must be lined true on the east side of the track, but on curves the inside of the curve must be the line side. (When there is no line side to the track, the tie may be placed so that each rail will get an equal bearing.)
21. The largest ties are to be used for joint and shoulder or side ties.
22. The rail joint must be brought as near as possible to the centre of the tie, and the shoulder ties must be placed an even distance (about 10 in.) from the joint tie.
23. The joint tie should be the last tie tamped under the rail, both side ties being thoroughly tamped before the joint tie.
24. The filling between ties must be sloped from the centre of the track to the bottom of the tie, or according to instructions received from time to time.
25. No material is to be placed more than 4 in. above the top of the ties between the rails.
26. The rails should be given a full and even bearing on the tie, and this should always be done by adzing the tie, but this must not be cut too deep.
27. Rails are to be laid with square joints, except when a rail is replaced by two pieces. No joint to overrun more than 4 in. before being cut.
28. All crooked rails must be straightened before being laid in the track.
29. All rails for curves must be properly curved before they are laid in the track. Make no exception to this rule.
30. Five-sixteenths ($\frac{5}{16}$) of an inch is to be allowed for expansion in cold, and $\frac{1}{8}$ in. in warm weather, unless otherwise ordered.
31. Spikes must always be driven into ties perfectly straight (plumb), and not inclined to or from the rail.
32. Spikes must always be put on with full number of bolts and kept screwed close; wooden fish-plates, with iron washers, must be used where needed.
33. You must have a level board and use the same for leveling track on straight lines. It must be properly notched to enable you to give the proper elevation to the outer rail on curves.
34. You will see that the track is perfectly level on straight alignment by placing the level-board over every joint.
35. "To determine the elevation for the outer rail on curves, take a cord and stretch it between two points (on that

part of the curve in good line) which are 53 ft. apart. The distance from the centre of the cord to the inside of that rail will be the elevation needed in track."

36. Guard-rails at switches should always have a casting or plank spiked to them to prevent them from turning over.

37. Highway crossings must be spiked down and kept in good order, and all snow and ice cleaned off.

38. Switches must be kept clear of snow, ice and dirt, properly oiled and in good working order.

39. You will be furnished with a switch key, for which a receipt will be taken. In case the key is not returned to the Road-Master when you leave the service of the company, \$5 will be deducted from pay that is due you.

40. The road-bed must be cleared of all weeds and trash, and the limbs of trees cut off so as not to obstruct the track or trains.

41. All ordinary repairs of fences must be made and material for same kept on hand at the station.

42. When extraordinary repairs are needed, notify the Road-Master. Places where stock is troublesome or likely to be killed must be reported.

43. You must guard against fires by having weeds cut closely during the fall.

44. Bridges and trestle-work must be examined to see that they are not damaged by fire from engines.

45. You must carefully clear away from approaches to bridges and buildings, any old material, dry grass, or anything of a combustible nature, which would be likely to endanger a structure in case of a fire.

46. A double swath must be cut a sufficient distance from fences to prevent flames from reaching them, that a strip of grass about 6 ft. wide may be burnt adjoining the right-of-way fence, to insure its safety. Fire must be started when the direction of the wind is away from the fence.

47. During severe rains or storms every precaution must be taken to prevent accidents.

48. In case of an accident to trains, the nearest section foreman will take their whole forces to the assistance of the train, even if it is not on their sections, and, until the arrival of the Road-Master, will act under direction of conductors of trains.

49. In cases of a wreck, you must look after company property, and see that it is not stolen or destroyed.

50. All accidents must be reported in full, given nature and extent of same, and cause as far as known.

51. The track must not be obstructed in any way without taking the precaution of setting out the proper signal for trains: a red flag by day and a red light by night, placed by the side of the track, indicates that trains must run slow over it. When placed in centre of track (between rails) it indicates that trains must come to a full stop. One torpedo exploded under engine is the signal to run slow, and two explosions is the signal for train to stop immediately.

52. Signal lamps must be well trimmed and cleaned and kept ready for use at night.

53. You must return the time of yourself and gang promptly, on the regular blanks, at the end of each month, allowing time only for actual work done.

54. When a man is discharged you must make out his time on form "A," noting on it to what station the money is to be sent, and forward it to your Road-Master. You will also return time of discharged man on time-roll at the end of each month, noting opposite the name of the man that he has been discharged. A discharged man will be given an identification check (form F), but no certificate or time check.

55. Persons discharged from one division of the service shall not be employed in another, without the consent of the Road-Master who dismissed him, or the head of the department.

56. From and after this date employees of this department, while riding over the road on passes, must not occupy the ladies' coach or sleeping car, nor occupy seats in any car, when, by so doing, it would cause passengers to stand.

57. Employees are not entitled to ride on trains without having a pass or paying their fare. Applications for passes will be made to Road-Masters through the section foremen.

58. No section-man is to perform the duties of trainmen in the way of coupling, braking on cars, nor take any risks outside of their regular duties.

59. You will generally be governed by instructions from your Road-Master concerning the work. Should any order be received from others in authority, for any particular work, which did not come directly from the Road-Master, it must be reported to him as soon as possible.

60. When an order is given directing any named rate of speed for trains over bridges, any violations of same, or neglect to regulate speed, when properly signaled, will be reported to the Engineer of the Road Department.

61. Foremen must know that their track-gauge is perfectly true, by comparing it as often as may be necessary with the standard gauge in the possession of their respective road-masters.

62. You must send an experienced man, at least every other morning, to walk over the whole of the section not traversed by the hand-car, to inspect joints and rails, with necessary appliances to repair track, such as broken rails, replace missing bolts and spikes, tighten nuts and any other work that can be done by one man.

63. Watchmen neglecting their duties are to be reported.

64. You must be careful to classify the labor for all work done, stating plainly the kind of work and where performed.

65. All damages to cars, material and tools in your charge, caused by your negligence, must be paid for by you, and the company reserves the right to withhold any money, then or thereafter to become due, to defray the cost of repairing or replacing same.

66. You must deliver up the property of the company whenever the same may be demanded by the proper authority.

67. You must have suitable tools and a proper supply of material on hand to do all work, and must see personally, before starting to work, that the proper tools and material are taken along for performing every kind of work that may be necessary.

68. You must not lend or give away, under any circumstances, material or tools belonging to the company.

69. All scraps, materials, rails, etc., taken out of the road-bed, and which cannot be used again, must be picked up and taken as fast as practicable to the stations, and placed alongside of the track ready for shipment.

70. No material is to be piled within 6 ft. of the track, nor to such a height as to endanger the track.

71. Material and freight dropped from trains must be taken to the nearest station and delivered to the agent, or shipped as marked.

72. Requisitions for supplies must be made by the foremen on their respective road-masters.

73. Tools, hand and dump cars needing repairs, will be shipped to Master Builder, Cedar Rapids (J. L. Hardwick), with tags attached, and suitably addressed, with name of sender and station plainly marked in ink thereon.

74. Notify Road-Master when your cars need to be sent

in for repairs, and you will be furnished with an extra car to use until yours is returned, when the extra car must be promptly forwarded to Master Builder at Cedar Rapids.

75. Hand-cars are for the use of trackmen in performance of their duties, and must not be used for any other purpose without an order from the Road-Master.

76. Section-men, in cases of necessity, will be expected to work on Sunday, at the same rate as paid for work done on the other days of the week.

77. You must carefully study these instructions and exact prompt and strict obedience of same from your men. If there are any employees who are not willing to follow these rules entirely, they are requested to leave the service of the company at once.

Your attention is called to the fact that the lives of passengers and employees, as well as loss and damage to property carried over the road, are largely dependent on the faithful performance of your duties.

Ignorance of these rules, or of anything contained herein, will not be accepted as an excuse for violation of or non-obedience to them.

INSTRUCTIONS TO BRIDGEMEN.

1. You will be furnished with the bill of material needed for each structure before your men are sent out on the work. You must, as soon as you reach the bridge site, check the material delivered with your bill to see that both agree, and must personally ascertain, as quickly as possible, if the bill of material includes all that will be required. If the requisite amount of material is not delivered, you must notify the Master Builder of the deficiency, that the same may be forwarded promptly. Any material unfit or not proper for the structures will be reported without delay, that another kind may be substituted.

2. You must see before starting for work, that you are fully equipped with the necessary tools to do your work. You must bear in mind that you are liable to be called away at any time from work upon which you may be employed, to that of a more pressing nature, and in order that you may be fully prepared for such exigencies must see that you have the facilities at hand for moving from place to place, at short notice, and are provided, as far as practicable, with the necessary tools to do all kinds of bridge work.

3. All bridgemen are expected to be prompt at the depot when it is necessary for them to take trains to reach their work; as far as possible, they will be expected to board near the place where they work. Repeated failures to be in time for trains will be considered good grounds for dismissal; men so left will be docked for time in transit when they take the next train, and receive pay only for time actually at work.

4. All men in the service of the company must report to the head of their department any misconduct or negligence affecting the interests or safety of the road or property, and which may come within their knowledge. The withholding of such information to the detriment of the company's interests will be considered a proof of negligence and indifference to the company's interests.

5. Foremen must actively engage in their work with their men, and see that all the force working under their orders faithfully perform their duties and work full time.

6. Bridgemen will be held responsible for all company tools and material put in their charge. In case of breakage or loss, the company reserves the right to withhold from money now or hereafter due them, a sufficient amount to repair or replace them, as may be thought best by the head of department.

7. You must fill out in full all blanks and forward the same in accordance with instruction given, and must inform yourself about all rules and regulations of the company, and be governed accordingly in the prosecution of your work, and must study and always have a copy of the time-card in force.

Hand-cars must not be left on the track when not in use, but must always be safely cared for.

Signals must always be put out at the proper distance when the roadway is not in good condition for the passage of trains.

8. You must see that your men are not unnecessarily exposed to accidents which will in any way render the company liable for damages.

9. Bridgemen are expected to pay their own board promptly, and in case of failure, the company reserves the right to withhold from money now or hereafter due them a sufficient amount to pay the same, but does not assume any responsibility for board. A repetition of the offense will be considered sufficient cause for dismissal.

10. Tools must not be carried into the ladies' car and employees of the bridge department must not occupy seats when by so doing passengers are obliged to stand.

11. Any employees not disposed to comply with these instructions are requested to leave the employ of the company at once. The orders will be read to or by each man employed before he commences work. Any failure to have this done will subject the Foreman to discharge from service.

12. Bridgemen, in cases of necessity, will be expected to work on Sunday, at the same rate as paid for work done on the other days of the week.

THE SCRAP HEAP.

Locomotive Building.

The Pittsburgh Locomotive Works in Pittsburgh are building 14 engines for the new Pittsburgh, Cleveland & Toledo road.

The Baldwin Locomotive Works in Philadelphia recently delivered two shifting engines to the Kentucky Central road.

The Pennsylvania Railroad Shops in Altoona, Pa., have recently completed several ten-wheel freight engines for the Chicago, St. Louis & Pittsburgh road.

The Cooke Locomotive Works in Paterson, N. J., have a large order for locomotives for the Panama Railroad.

The Rhode Island Locomotive Works in Providence are building 5 locomotives for the government lines in Nova Scotia.

Car Notes.

On Sept. 1 Mr. W. C. Allison transferred his tools, machinery and stock to the Allison Manufacturing Co. The new organization will continue the business of manufacturing railroad cars, car wheels, boiler tubes, gas-pipe and general iron work, as conducted by Mr. Allison for so many years. The officers of the new company are: W. C. Allison, President; L. J. Piers, Secretary; James O'Neill, Treasurer. The office is at Thirty-second and Walnut streets, Philadelphia, with a branch office in the Mills Building, New York.

The Barney & Smith Manufacturing Co., in Dayton, O., recently delivered 6 new passenger cars to the Kentucky Central road for local service.

The Georgia Car Co. has removed its works from Cartersville, Ga., to Anniston, Ala., on the line of the Georgia Pacific road.

The Brownell & Wight Car Co., in St. Louis, has recently added a large steam hammer and other new machinery to its works.

The Litchfield Car & Manufacturing Co., at Litchfield, Ill., is building 20 emigrant sleeping cars for the Texas & Pacific road.

The Chicago & West Michigan shops at Muskegon, Mich., are building several new passenger cars and 50 freight cars for the road.

The Jones Car Works in Schenectady, N. Y., recently delivered three passenger cars and a baggage, mail and express car to the Marquette, Houghton & Ontonagon road.

Iron Notes.

Monocacy Furnace in Berks County, Pa., has been repaired and was to go into blast this week.

The new mill of the Hartman Steel Co. in Beaver Falls, Pa., is completed and is working well. The capacity of the mill is 200 tons a day of steel rods and wire.

The Goshen Iron Co. has been organized with \$300,000 capital at New Philadelphia, O., for the purpose of buying and operating the rolling mill of the Ward Iron Co., which recently failed.

The works of the North Chicago Rolling Mill Co. at South Chicago are to be started up next week.

Vulcan Furnace at Newberry, Mich., has gone out of blast and will be overhauled and repaired.

Milton Furnace in Jackson County, O., is being repaired and improved, and will go into blast as soon as it can be made ready.

Wellston Furnace at Wellston, O., is in blast, making 22 tons a day.

It is said that Canadian iron ores will be used extensively this winter in the furnaces in and near Cleveland.

Eliza Furnace in Jackson County, O., has been rebuilt and will go into blast in about two weeks.

Manufacturing Notes.

The American Brake Co. in St. Louis has supplied 25 sets of its locomotive driver and tender brakes to the Panama Railroad.

The Harlan & Hollingsworth Co. in Wilmington, Del., is building an iron ferry-boat for the Delaware River; a side-wheel steamboat for service on Puget Sound; an iron steamer to run between Philadelphia and Boston; an iron collier for the Consolidation Coal Co., and a very large steel yacht for Mr. Astor, of New York.

The Westinghouse Air Brake Co. has nearly completed a large addition to its works in Allegheny, Pa., more than doubling their capacity.

The Rail Market.

Steel Rails.—The *Iron Age* says: "There is still a considerable amount of mystery connected with the Bessemer interest. Anything absolutely definite in regard to price or quantity sold seems to be unattainable at present, but that orders for considerable quantities have been taken at prices less than \$37 would doubtless be a perfectly safe assertion. Rumor mentions \$35 to \$35.50 as the rate accepted for one lot, but those likely to be perfectly well informed consider that at least \$1 per ton more was paid. The nominal rate for winter and spring delivery is understood to be \$37, with slight concessions on orders specially desirable as to quantity, time of delivery, terms of settlement, etc."

Rail Fastenings.—Spikes are unchanged at \$2.60 per 100 lbs. in Pittsburgh, and track-bolts at \$3 to \$3.25 per 100 lbs., according to pattern. Splice-bars are a shade lower, at 1.9 cents per pound.

Old Rails.—Some sales of old iron rails are reported at \$23.50 per ton for tees at tidewater. The market is more active than for some time past.

The Roanoke Machine Works.

These extensive works, which are now completed, are located at Roanoke, Va., and have cost about \$750,000. They have been carefully planned and well arranged, with the view of doing all the important repair work of the Norfolk & Western and the Shenandoah Valley roads, which meet at Roanoke, and of building in addition 30 new locomotives and 3,000 cars yearly. The works have been planned and built under the supervision of Mr. Charles Blackwell, Superintendent of Motive Power of the Norfolk & Western and the Shenandoah Valley roads; as they are now completed, he has retired from the position of Superintendent, in order to devote himself to his duties on the two roads. Mr. Samuel B. Haupt succeeds him as Superintendent of the works.

The works are owned by stockholders who are largely interested in the two roads, and will be controlled by their management.

Fish-Joints—A Query.

A correspondent makes the following inquiries: "What is the cause of fish-joints 'kicking out' where they are put in broken joint style?"

"Also, what is the most practical way for track hands, to proceed where straps have to be used that seem to have been warped when they were rolled out?"

Can any of our readers answer these inquiries?

On the Other Track.

A right amusing incident occurred near Noble's foundry yesterday morning. A man crossing the railroad tracks got his foot caught fast in a disjuncted "frog," and while trying to get loose he saw the Chattanooga train on the East Tennessee, Virginia & Georgia road come dashing over the bridge. Wild with fright, the man jerked his leg almost out of joint, and came near breaking his foot in his efforts to get loose. But the train was almost upon him, and he decided to unlase his shoe, pull his foot out and leave the shoe to be mashed. He acted upon this thought, and as he got his foot out the train glided by on another track. It made the man so mad to think that he was on a plagued little side-track all the time that he took the shoe up and kicked himself all the way up to the depot.—*Rome (Ga.) Courier*.

Cable Railroad in Philadelphia.

There is no doubt now that cable railways will be built in this city on Market street, and from Twenty-third and Columbia avenue to the Market street ferry, by the present Union line route. These are great enterprises, and will give the cable railway system the most complete test to which it has yet been subjected. The Union line route involves many turns, heavy grades, and the crossing of a great number of other railway tracks. If the cable can be successfully run on that route, it will be available for use on any line of city railway. The subject has been carefully considered, and it was not determined to build the new line until a full test had been made of the capacity of the short line on Columbia avenue, west of Twenty-third street. It is believed that the cable system will prove much more economical than any other known method of propelling cars, and that is the reason for its adoption. It will prove of great advantage to the public, allowing the company to run trains of cars at hours of the day when there is a great press of travel.—*Philadelphia Ledger*, Sept. 18.

Rival Powder Companies.

A correspondent sends us the following: "At the new Vosburg tunnel on the Lehigh Valley Railroad the Atlas Rend-Rock and the Vulcan Powder companies are contesting for the contract for furnishing the blasting powder to be used in the tunnel. Each company's powder is to be used

for seven days to do the blasting, and the one with whose powder the most progress is made is to get the contract. "This tunnel is excavated for double track, is 4,000 ft. in length, and it will shorten the road 5½ miles. The work is under contract to Lentz & Co., of Mauch Chunk, Pa., and is to be completed about May next."

A Terrible Collision.

Petersburg Junction, near Troy, N. Y., was the scene of quite an amusing and serious scare for the railroad men a few nights ago. Between the Junction and Hoosick, for several miles, the Troy & Boston and the Boston, Hoosick Tunnel & Western railroads run parallel with each other and only a few feet apart. About midnight a freight train on the Troy & Boston Railroad was running east when the engineer heard the whistle of an approaching train from the opposite direction. A moment more and the headlight of the rapidly advancing train caused him to tremble with horror and fright. The train came dashing around the curve, and the engineer, giving up all for lost, bravely determined to die at his post. The engineers of both trains whistled "down brakes," but the trainmen were so terrified to obey the order, and thought only of saving their own lives. "Jump for your lives," was the wild cry that pierced the night air. But it was too late. In another moment the two trains met—and passed on different tracks. It was some time, however, before the two men on the two trains could see what a funny joke it was.—*Buffalo Commercial*, Sep. 13.

The Long Chord.

A certain railroad in New England is being double tracked, preliminary to which the alignment is being retraced and improved when possible. An active youngster has recently been added to the engineer corps, whose theoretical knowledge of railroad work is, as yet, somewhat limited. He is anxious, however, to make himself useful as he sees an opportunity. A long curve had just been run which for some reason did not turn into forward tangent properly—it was suggested that the "long chord" be tried again, which had been resorted to in passing an obstacle. The young man was attentively standing near by and at the mention of the long chord immediately took from his pocket a large fish line which he handed out saying: "You can have this if it is long enough."

He has since read up on the subject and can turn to the page in Henck's "Field Book" on long chords without resorting to the index—and affirms it will be long enough before he is again caught with a fish line.

Stealing a Locomotive.

A Newport, Vt., special says: "A few hours before the failure of Bradley Barlow and the Southeastern Railroad was announced, a stranger on the Canada side of the line hired a special train to convey him to this place. He urged private business and paid \$60 for the ride, but on arrival here the locomotive was at once attached by a deputy sheriff in the interest of the special passenger, who proved to be a creditor who had resorted to this ruse to get security for his claim. It was necessary for Sheriff Bowley to keep close watch of the engine for fear of its being recaptured by the Southeastern men, and for that purpose he has kept a man upon it through the day, and had men sleeping in the cab nights. Eugene Bowley, the sheriff's son, and a man named Flemming were asleep upon the engine last night, when they were awakened about 2 o'clock by an engine passing. They thought nothing of the matter until they found themselves grasped and dragged out of the cab. There were six or more men in the attacking party, and the two men were of course overpowered. Their revolvers being taken from them, they were held by four of the assailants while the rest coupled the two engines together and got them on the main track ready to start. The rest then sprang aboard, and the party was off toward Richford before the two watchmen could collect their senses.

"No lights were shown until the party were safely away from here. During the fracas the lantern belonging to the watchman was broken to atoms. On this account, and owing to the darkness, it was impossible to identify the members of the attacking party. The watchman bears marks of severe treatment."

A Tramp's Collision.

A Wilmington, Del., dispatch to the Philadelphia Press of Sept. 5 says: "A collision between a freight train and a passenger accommodation, leaving this city at 6:25 p. m., occurred at Green Spring station, on the Delaware Railroad, last night. The freight had been run on a siding to wait the coming of the passenger train, and the crew had left the locomotive and cars to go a short distance to eat their supper. While the train was thus deserted a tramp boarded the engine, threw open the throttle and pulled the train off the siding on to the main track in an opposite direction to that from which the passenger train was expected. A freight car which stood in front of the engine was pushed on ahead. The tramp, after starting the train, leaped to the ground, making his escape, and none of the train's crew could board the fugitive locomotive. Word was promptly wired to Townsend, a few miles above, to get the passenger train out of the way of the unmanned engine. It had already passed below Townsend, however, when the message was received, and those knowing of the affair awaited the climax with wild excitement. A party of the railroad officials at Clayton boarded an engine and started in pursuit of the freight, but they could not catch it.

"At Green Spring station the south-bound passenger train, running fast to make up lost time, collided with the freight car which was in front of the runaway engine. The shock of the collision threw all the passengers from the seats and broke the two engines to pieces, smashed the freight car between them into splinters, and broke the platforms and bumpers of several other cars. The engineer of the passenger train states that he saw the train coming just after he had passed Green Spring station. The freight car ahead concealed the locomotive's headlight, and the train was fairly upon him before he discovered it. He quickly reversed his engine and applied the air-brake, and almost immediately afterward the crash came. The freight train was running rapidly and upon striking the passenger engine some of the cars were knocked from the track and badly broken.

"The passenger cars were less injured, and aside from the damages to their platforms were but little damaged. They were well filled with passengers at the time of the collision. All were badly shaken up. Mrs. Morris, of Dover, was thrown over several seats and seriously injured. A lady named Harris, of Harrisburg, on her way to the home of some friends in Dover, was thrown from her seat against a water-cooler and badly hurt. Ex-Messenger Wooters was cut and bruised considerably by being thrown over a seat back, and Mrs. Wm. C. Mitchell, of Dover, received serious bruises.

"The fireman, Wm. Collins, was badly scalded about the head, hands and body, besides being cut and internally injured. His injuries will probably prove fatal. Medical aid was promptly summoned from Smyrna and the injured persons attended to. A special train from the Smyrna Branch conveyed all the passengers who were able to travel to their destination. The escape of Engineer McConaghy was miraculous. He was sitting at his post when the col-

lision occurred, and stepped from the cab to the tender just in time to escape being scalded and crushed to death. His brave conduct in the face of threatening death undoubtedly prevented a terrible slaughter.

"After the engines had collided the trainmen promptly set to work to extinguish their fires beneath their boilers and prevented a threatened additional disaster to the calamity. The tramp whose nefarious work caused the collision is still at large."

The Perils of a Special Train.

A special train, which left Charing Cross at 5 minutes of 6 on Monday evening to pick up returning excursionists from Gravesend, was considerably delayed, owing to some unforeseen circumstances. The train was proceeding toward Greenwich, when the driver observed a donkey on the line. An endeavor was made to stop before the animal was reached, but without success, and the poor beast was dragged along by the fire-box of the engine. The train was stopped, and, with great difficulty, the body of the animal, which was killed, was extricated from beneath the engine. While this was in progress, a balloon, called the "Sunbeam," passed over, going in the direction of Northfleet. The two aeronauts in the car were throwing out ballast, but notwithstanding this the balloon descended slowly, and when some distance ahead of the train was, to the horror of the passengers, seen to drop suddenly into the railway cutting two or three hundred yards in front of the engine. As the balloon dragged the car and its occupants over the down line there seemed nothing but certain death for them; but suddenly the "Sunbeam" took an upward flight, and dragging the car clear of the line, fell into an adjoining field, just when the train was within a hundred yards of the spot.—*London Letter*.

A Railroad Relic.

Fire Marshal Carroll, while on St. Paul street this morning, secured a spike which, if not exactly as valuable as the one recently driven out West by Henry Villard, can at least lay claim to greater age and prior historic interest. The spike in question is much eaten by rust and was found in a strap rail which was unearthed by some men while making excavations for a sidewalk. It is a relic of the old Rochester & Carthage Railroad which was successfully operated by horse power up to 1844, and ran from the Erie Canal in this city to the now extinct village of Carthage, near the lower falls of the Genesee River. At a point where Brewer's dock is now situated the railroad descended to the banks below at a very steep incline. At the top of the heights horses operated a drum upon which coils of rope wound and unwound, drawing one car up while another car descended. So steep was the road operated at this point that the hind wheels of the cars were made about 10 ft. in diameter while that of the front wheels was but 2 ft. or so. An immense amount of shipping was done by means of this railroad between the lakes and the canal. The flouring mills located at the falls were supplied with grain in this manner, and shipped their flour in return.—*Rochester (N. Y.) Post-Express*.

Where Conductors are Appreciated.

The seat at the head of the table is vacant, and there are many inquiries for "the Captain." Presently the conductor comes in and fills the vacant chair, and then I learn that the conductor, in this part of the world, is always called "Captain." He is as much a hero as the driver in old staging days. Nothing is too good for him. The landlord discovers that "the Captain ain't got no chicken," and waiters are sent flying to fetch some. He is a bigger man than old Grant; next to being head waiter in a summer hotel, I think I should like to be a railway conductor in Virginia. I noticed he talked with all the pretty girls, and, what was better, they all seemed to like it.—*Correspondence New York Times*.

A Criticism.

In its report of the Road Masters' Convention the St. Paul Pioneer-Press says:

During a lull in the proceedings, a reporter of the Pioneer-Press called the attention of several delegates to a very scientific article, recently published in a railway journal, entitled "Some Rules for the Trackmen." As road-masters and trackmen are practical, hardworking employees, with neither time nor inclination for abstruse mathematical researches, their comments on the problem above referred to were rather amusing. Here it is:

Problem.—Given a main line curve whose diameter is nd , and a frog whose number is f , to find the position of the frog with reference to the heel of the switch, and the character of the turnout curve. * * *

"The following formulae are general and apply to each case of the problem:

$$\cot. \frac{F}{2} = 2f \quad (1)$$

$$\tan. \frac{K}{2} = \frac{g}{nd} \quad \cot. \frac{F}{2} = \frac{2fg}{nd} \quad (2)$$

"Case I. a. If $f^2 < \frac{nd}{4g^2}$ and the frog be placed on the

outer rail of the main line curve, the turnout curve will be a reverse curve from the main line etc., etc.

The reporter submitted this proposition and several more sections, townships and ranges thereof to several of the delegates, all of whom are practical men, trained in this calling and possessing just about as much useless knowledge of algebraical forms and problems as a cow possesses ability to climb a tree. One of the road-masters, who was asked for his opinion, suggested that the problem be framed and a copy be given to each of the laborers in his employ as a Christmas present. "Let me look at that little chromo," said another. "Given a main line curve whose diameter is nd —well, call that 'N. G.' and let it go. Yes, that's a very pretty little problem, and it ought to be generally adopted."

Elevated Railroad Tracks in Buffalo.

Has Buffalo any idea of the extent of elevated railroad lines now within her limits? Probably not, except in a general way, which is too vague to be very valuable. With the admission of the Lackawanna into the city the strong feeling against cutting up the streets with unhandy and dangerous tracks was sought to be appeased by ordering a great part of them built high enough to allow passage underneath. The West Shore following, it was naturally treated to the same, the result of which is miles of elevated tracks extending all along the north, east and south of the city. Reducing the various elevated sections to figures the following is the grand result:

Lackawanna line—Over the Falls Branch of the Central, 4,300 ft.; over the Belt Line and Broadway, 8,200 ft.; over the Erie Falls Branch, 7,800 ft.; over the Erie main line, 4,200 ft.; over the Lake Shore, 5,700 ft.; over the Central's Ohio street line, 2,000 ft. This gives a total of 32,200 ft. for the Lackawanna alone.

The West Shore's overhead trestles are not all built. For instance, it crosses the Falls Branch of the Erie by picking

that road up and holding it on its shoulders—that is to say, it has built two single-track overhead trestles for the Erie, each of which is 4,000 ft. long, though as they are intended for the same line, they should be given as one. For itself the West Shore is building a double-track trestle extending each way from Broadway. Eastward this trestle comes to ground 1,700 ft. from the Broadway bridge, and westward it extends 7,600 ft. to a point about 100 ft. west of Clinton street, from which point it is allowed to remain on land. Besides this there is building a single-track connection with the Buffalo Creek line in the vicinity of the Central's East Buffalo depot. This will be 2,500 ft. long.

On the Tift Farm the Lehigh coal transfer and stocking trestle, which is calculated to combine railroad, ship canal, trestle and tunnel styles of shipment, will be 1,500 ft. long, including two up-tracks and one return track, or 4,500 ft. in all. The whole of the woodwork here mentioned will be finished in less than 20 days, when Buffalo will be furnished with an amount of sky-tracking that few of even her most inquisitive citizens imagine.

The Lackawanna lines are all double tracked. Reckoning each track separately for Lackawanna, Lehigh, and West Shore, the aggregate amount of elevated tracks reaches 98,000 ft., or a little over 18½ miles, all built in about two years.—*Buffalo Express*, Sept. 6.

Whistles.

For the benefit of the distinguished foreigners in our midst, it is stated that by use of American Railroad phonetics, the New York, Pennsylvania & Ohio is condensed into "Nypano," the Pittsburgh, Wheeling & Kentucky into "Pewiky," and if circumstances demand it, Villard's Northern Pacific will have to come down to "Enpee."—*Pittsburgh Telegraph*.

"Is this train to stop at Neponset?" a passenger asked a conductor of the Old Colony road the other forenoon. "No, sir," was the reply; "no stops between South Braintree and Boston." "Why, how's that?" said the surprised inquirer; "you used to stop there; you did the last time I came up." The conductor was puzzled. "Guess you are wrong," he said; "but when was that time?" "Well," replied his passenger, "I can't say exactly." And after a moment's thought he continued, "It was when I built my barn—some time during the war."—*Boston Transcript*.

The Cincinnati, Hamilton & Dayton road has replaced its high-pitched, screaming locomotive whistles by low-toned, sonorous and musical ones—whistles which will murmur gentle lullabies in the ear of the drowsy passenger, so to speak. The only doubtful point about the change is that the sound of the whistles may prove so seductive as to lure cattle upon the track instead of frightening them away.

When a freight car was opened at Keene, N. H., recently, a hen fluttered out. She had been in the car 15 days and paid three eggs for her passage from St. Louis, but the agent of a cruel and grinding monopoly was not satisfied and seized her bodily in further payment.

Lost Baggage.

A day or two ago a man who was at the Central Depot to take a train suddenly cried out that some one had stolen his valise, and he began such a hullabaloo that everybody had to be interested.

"I sot that 'ere satchel right down thar' and stepped to the door," he explained to Officer Button, "and when I returned it was gone."

"Well, you should have been careful. We are not responsible for such losses."

"You ain't, eh? Whar's the President?"

"Out of the city, sir."

"Whar's the General Manager?"

"He's sick abed."

"Whar's the Superintendent?"

"Won't be here till 4 o'clock."

"Wall, now, somebody's got to make good that loss or about a dozen men will go to the hospital for six months apiece!"

"What was the value?"

"Fifty dollars and not a cent less!"

"What were the contents?"

"I had twelve shirts, a new suit of clothes, an overcoat, and lots of other things."

"Was it a carpet-sack?"

"She was."

"One handle gone and the lock broken?"

"Yes, one handle was gone, and I had her tied with a string."

"Is this it?" asked the officer, as he took the baggage off a bench not six feet away.

"Great snakes! that's her!" chuckled the owner.

In handing it to him the string broke, the bag flew open and out rolled two old shirts, a pair of socks and five or six paper collars—all there was in it.

"Then these are the duds you wanted \$50 for?" queried the officer.

"No, sir!" was the indignant reply. "I should have taken the money for loss of time and damage to my feelings. I'm no Shylock, sir!"—*Detroit Free Press*.

Tree Planting on the Northern Pacific.

General Manager Haupt has issued the following circular dated Sept. 1:

"Mr. George H. Wright has been appointed Superintendent of tree plantations on the Northern Pacific Railroad and will enter upon duty from this date. W. C. Butters will act as his assistant. Agents and other officers are instructed to facilitate, so far as may be practicable, the operations of this department by affording quick transit to plants and cuttings and proper protection while at stations. Facilities should also be afforded for prompt transportation of outfit, supplies and laborers from place to place as may be required during the season of active operations."

New Method of Pile-Driving.

A French paper gives a description of a method of pile-driving which has been successfully adopted in making the foundations for the Palais de Justice at Brunswick. Instead of the ordinary pile-driver, a simple framework is erected to hold the pile in position. Attached to each pile by staples are two tubes of about 2 in. diameter. These are carried to the pointed end of the pile, where they terminate and turn inward toward one another. The upper ends are in communication by flexible pipes with the city water main. When the water is turned on it rapidly excavates a hole, in which the pile sinks by its own weight; but should any unusual resistance be met with weights are fastened to the top of the pile. By these means, and under favorable circumstances, a 12-in. pile can be sunk to a depth of 50 feet in ten minutes. Each pile requires, on an average, 200 gallons of water.—*London Graphic*.

How She Did It.

A lady entered a ticket office in Toledo and bought a ticket for Milwaukee. She told the ticket seller that she had never traveled alone, and that her husband had always told her that she could not without trouble. She desired to disprove this. Accordingly she asked for all the information as to the departure of her train, the change of cars in Chicago, checking baggage, etc., and went from the ticket office smiling at the manner in which she would surprise her husband. A few minutes later the ticket seller found on the counter the ticket he had sold her, with the change.



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EDITORIAL ANNOUNCEMENTS.

Passes.—All persons connected with this paper are forbidden to ask for passes under any circumstances, and we will be thankful to have any act of the kind reported to this office.

Addresses.—Business letters should be addressed and drafts made payable to THE RAILROAD GAZETTE. Communications for the attention of the Editors should be addressed EDITOR RAILROAD GAZETTE.

Contributions.—Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies, the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and in their management, particulars as to the business of railroads, and suggestions as to its improvement. Discussions of subjects pertaining to ALL DEPARTMENTS of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections appointments, and especially annual reports, some notice of all of which will be published.

Advertisements.—We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay, EXCEPT IN THE ADVERTISING COLUMNS. We give in our editorial columns OUR OWN opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.

RAILROAD ACCIDENTS AND RAILROAD COMMISSIONS

The report of the New York Railroad Commission on the Carlyn accident, which was published in full last week, is interesting on account of its being the first report of its kind which that body has made. Since then there have been two other serious accidents on the Long Island Railroad, both of which will, doubtless, be subjects for investigation. That such investigations, if intelligently and honestly conducted, will have a most wholesome effect on the management of railroads, few at all familiar with the reports of the British Board of Trade on railway accidents will doubt. Heretofore, when an accident occurred on a railroad, there have usually been two different investigations, one by a coroner and a jury, and the other by the railroad officers themselves. With past experience as a guide, the probability that an investigation of this kind will be intelligently conducted by a coroner is exceedingly slight. In a few instances, such as that of the Ashtabula bridge disaster, the investigation was conducted with exceptional ability. Generally both the coroners and their juries are entirely ignorant of the practice and the art of railroad management, and often they are ignorant of almost everything else besides.

Investigations by the railroad authorities are usually made in the interest of the companies themselves, and sometimes by officers who deserve censure, and always by those who hold their places by the authority of the company or of a board of directors on whose shoulders the responsibility for the calamity may rest. Often it is desirable that evidence which could be used against a company should be hid or destroyed, and it sometimes happens that those who are in authority are obliged to shift the blame upon other shoulders in order to escape it themselves. There is good reason to suspect, too, that rules and regulations are often included among those intended for the government of operatives in the working of the road which are either not intended to be obeyed, and in some cases even are of such a nature that it would be impossible to obey them, but which are placed where they are so that in case of accident they may be used by those in authority to fix the responsibility on those who are below them, and who to a considerable extent are helpless to defend themselves.

Now an authority like a railroad commission, delegated with power to investigate accidents, if it performs its duties faithfully, is often able to show just what was wrong and who was to blame, and for that

reason may be very irritating to some who have felt that they are secure from "political" meddling.

On the other hand railroad commissioners generally have not been railroad experts. The result has been that some of their investigations and recommendations have had more or less of an amateur character and were for that reason irritating to experienced and practical railroad men, when, as is sometimes the case, their recommendations assumed the form of unnecessary interference with railroad management. It of course would be better if railroad commissioners, or some of them, were experts, or if they are not, if they would consult more with those who are; but the evil is one which, in a measure, cures itself. Their work, if it be immature, is apt to be so severely criticised that they rapidly learn by experience—if they are allowed to hold office long enough to acquire experience. The amount of knowledge that can be acquired in this way will in a measure be dependent upon the time that a man holds the office of commissioner. Should the American theory of rotation in office prevail, these railroad commissioners, like most of our other officials, will probably always be inexperienced in the performance of the duties assigned to them.

Considering the importance of having the causes of railroad accidents investigated by an impartial authority, the first report of this kind of the New York Commission is a source of satisfaction on account of its completeness and fairness. It is perhaps unduly severe in the recommendation that Barry, the station agent, should be discharged for neglecting to "see that the standing cars were secured against the possibility of being blown out on the main track." It was not definitely proved that the car was blown out, and the wind may not have caused the accident. The station agent was certainly censurable, but discharging a man, and thus taking from him the means of making a living, and placing him under a cloud, which will be a serious obstacle in the way of his employment elsewhere, is very severe punishment, which although just and proper in severe cases seems hardly warranted in this.

The second conclusion censures the company for running so heavy a train propelled with two engines, and calls attention to the danger of doing so, especially when the engines are not arranged so that the brakes can be applied from the front engine. Probably this lesson, inculcated in so distinct a manner, will be ineradicably impressed on the minds of a large proportion of the railroad officers in the country. At any rate, any company which hereafter runs two engines on a passenger train without connecting the first engine with the brakes of the train behind will be assuming a serious responsibility. The report of the New York Commission has authoritatively declared the practice to be dangerous, and probably one of the immediate effects of the report will be that on those roads on which two engines must be used to a single passenger train, the engines will be equipped with the requisite apparatus, so that the front engine can be coupled with the brakes in the train behind. It is likely, too, that a good many "double-header" trains will be divided up, with an engine to each section.

The third recommendation, that all passenger coaches and engines be equipped with automatic air brakes and that the track be inspected more frequently, is a matter of course. The cautious way in which the commissioners recommend "that the road direct its attention toward the adoption of a safety switch which shall prevent the accidental return to the main track of cars switched therefrom," indicates that here they do not feel quite sure of their ground. If some company would lay down a few side-tracks with throw-off switches, similar to the plan illustrated and described in the *Railroad Gazette* of Aug. 17, probably the commissioners would then have no hesitation in recommending their adoption in a more decided and emphatic way hereafter, especially for sidings which are not level.

Altogether the report is a very excellent one, and if the commissioners investigate and report on the two recent serious accidents which occurred on the Long Island Railroad in an equally thorough and able manner, the effect will be very salutary, as their conclusions will be, as it were, formulated with authority; and if their recommendations are wise few railroad companies or railroad managers will be disposed to take the risk of disregarding them.

GROWTH OF TRAFFIC AND PROFITS OF NEW YORK RAILROADS.

A pamphlet has recently been circulated in Wall street, in which has been set forth the progress of a great railroad company since 1874, intended to show that it is a rapidly improving property and that its

securities are worth much more than they are selling for. So far as the purpose is concerned, we do not here question its position or discuss its conclusions, but there is a notable omission in its statistics of those which are most significant from a financial point of view. To show that there is a great growth of traffic in the railroads which carry to New York, the pamphlet gives the total tons carried by each of the six principal lines, as follows:

	1882.	1874.	Increase.	P. c.
New York Central.....	11,330,393	6,114,678	5,215,715	85.3
Erie.....	11,895,338	6,334,276	5,561,062	87.0
Pennsylvania.....	35,840,070	16,420,321	19,419,749	118.3
N. Y. & New Haven.....	1,661,513	837,832	823,681	101.2
Central of N. J.....	7,405,172	4,811,664	2,593,508	53.1
Lackawanna.....	6,901,912	3,723,763	3,178,149	85.3
Total.....	75,038,288	50,673,012	24,365,276	72.7

This growth, on the average nearly 73 per cent., is a magnificent showing truly, and if profits were at all in proportion, and charges on capital account increased only in proportion, the prospect for shares in all these railroad properties would be most brilliant. One could not go wrong in buying any of them.

But we cannot accept a "ton hauled" as a unit. Here the ton that goes from New York to Newark counts for as much as that which goes from New York to Buffalo or Pittsburgh, seventy times as far. We are therefore not quite sure what the growth of freight traffic has been, either in the aggregate or on the separate roads, from this table. To make sure we have compiled the following table of the tons carried one mile on these roads.

	1882.	1874.	Increase.	P. c.
N. Y. Cen.....	2,394,793,000	1,391,560,000	1,003,233,000	72.1
Erie.....	1,954,390,000	1,447,400,000	506,990,000	86.6
Penna.....	3,977,280,000	1,916,592,000	2,060,688,000	107.6
N. Y. & N. H.....	117,459,000	36,092,000	81,367,000	225.5
cen. of N. J.....	680,777,000	386,116,000	294,661,000	76.3
Lackawanna.....	415,684,000	211,742,000	203,942,000	86.2
Total.....	9,540,329,000	5,989,522,000	3,550,807,000	76.0

This makes the true increase in freight traffic 76 per cent. instead of 72.7, as shown by the table of the number of tons hauled—a somewhat more magnificent growth even than that promised—and the average distance carried has not increased on any trunk line, indicating that the increase in local has been as great as that in through traffic, and that freight earnings may have grown somewhat in proportion to traffic.

The deduction of the pamphlet that there has been a wonderful growth of traffic is thus more than confirmed.

But investors have more interest in earnings than in traffic, and more interest in profits than in earnings. The first inquiry, we should suppose, of one investigating the finances of a company would be into the course of gross and net earnings. How does the growth of freight earnings on these roads compare with the vast growth in freight traffic? We shall see below:

	1882.	1874.	Inc. or Dec.	P. c.
N. Y. Cen.....	\$17,072,252	\$20,348,725	Dec. \$3,276,473	13.2
Erie.....	14,642,128	13,740,042	Inc. 902,086	6.6
Penna.....	34,829,240	23,713,915	Inc. 11,115,325	46.9
N. Y. & N. H.....	2,065,856	1,331,000	Inc. 734,856	55.2
cen. of N. J.....	8,643,168	6,958,178	Inc. 1,684,990	24.2
Lackawanna.....	5,093,190	4,629,862	Inc. 463,328	10.0
Total.....	\$82,945,804	\$70,722,249	Inc. \$12,223,555	17.1

This is a very different picture. Though freight traffic has increased 76 per cent., freight earnings have increased only 17.1 per cent.; on the New York Central, where the traffic has increased 72 per cent., the earnings have decreased 13 per cent.; the Erie gains but 6.6 per cent. in freight earnings, though its increase in freight traffic is 86 per cent.; for the great increase of 47 per cent. in earnings, the Pennsylvania carried 107 per cent. more traffic, and on every road the amount of additional work done to earn an additional dollar has been something enormous. Considering that there has been some increase in road by most of these companies, an enormous increase of rolling stock by all, and a great increase in the capital on which interest must be paid by several, this increase of 17 per cent. in freight earnings in eight years is not so encouraging after all. The fact is that the vast growth in a railroad freight traffic is very largely the result of a great reduction in freight rates, and not simply of increase in production, great as that has been since 1874; while the increase in production itself is largely due to the same reduction in rates, which can not continue to be great or rapid, simply because there is not much of a rate left to be reduced. For instance, in 1874 the average rate of the six roads named was 1.18 cents per ton per mile; in 1882 it was but 0.87 cent. It is obvious that we cannot take from the rate in the next eight years as much as was taken in the past eight, and so reduce it to 0.56 cent., unless there shall be some revolution which will reduce expenses in a way heretofore unheard of, and in fact, for two or three years past expense per ton per mile has generally not been decreased at all, and on several roads has increased from the minimum. We may not expect then, to anything like the same extent as heretofore, that particular stimulation of production which was due to a great

reduction in the cost of transportation—that is, we may not do so on such roads as these, where rates are already so low.

Profits, however, and not gross earnings, are what the investor needs to consider. A railroad does not live by freight alone, though for a long series of years and until quite recently freight was the only traffic which made any considerable growth, at least this side of the Mississippi.

Now the net earnings of these six roads in 1874 and 1882 were:

	1882	1874	Inc. or Dec.	P. c.
N. Y. Cen.	\$11,232,807	\$11,108,798	I. \$124,009	1.1
Erie	6,887,680	5,045,161	I. 1,842,519	36.8
Penna.	18,132,423	13,722,576	I. 4,409,847	32.3
N. Y. & N. H. .	2,325,177	1,797,262	I. 527,915	29.3
Cen. of N. J. .	4,901,223	4,468,675	I. 432,548	9.7
Lackawanna....	2,886,057	3,050,981	D. 164,924	5.4
Total	\$40,065,972	\$39,183,553	I. \$882,419	2.1

This makes a little better showing than the freight earnings, but only a little. On the average these roads have an increase of 19 per cent. over 1874, which, however, was not a bad year for them all, but a good one instead, the crops of 1873 having been extraordinary, and the freight movement on the trunk lines unprecedented at that time, while expenses went down more than rates in this first year after the panic, and the numerous railroad failures at that time were due more to an increase in fixed charges than to a decrease in net earnings. Seven millions and a half is a great deal of money, it is true, and a gain of 19 per cent. in net earnings would be quite satisfactory to stockholders if there were no increase in the charges for interest and rentals which have to be paid before they can get any dividends. It is not, however, such an improvement as is indicated by the increase of 76 per cent. in freight traffic on which the pamphlet mainly depends to maintain the thesis that stocks and bonds are cheap.

The charges which come before dividends of these roads, or rather of some of them, have increased greatly in the eight years by increased debts and rentals. The Pennsylvania pays about \$3,700,000 more on these accounts, and besides has an increase of capital stock of about \$22,000,000 which will require \$1,760,000 a year for the 8 per cent. dividends recently paid. The New York Central pays about \$1,600,000 more for interest and rentals; the Erie \$1,675,000 more, and there is a large increase on the Central of New Jersey. Thus the additional net earnings have not been acquired without additional expenditure on capital account—so large that the surplus available for dividends was not larger in 1882 than in 1874, but smaller, while the share capital to receive dividends was larger by the increase on the Pennsylvania Railroad.

One of the roads, indeed, which paid 10 per cent. in 1874, paid nothing in 1882; two others which paid 10 per cent. in 1874 paid 8 last year. The Erie paid 1 per cent. on its common stock in 1874; nothing afterward.

It is not to show that any railroad stocks are high or low that we write, however, but to give warning that any conclusion concerning the course of railroad profits, and especially shareholders' profits, drawn from the course of freight traffic is likely to be altogether misleading. If profits increased with increase in the work done, there would be few railroad stocks, except new ones, without large dividends. But the railroads have had to work for lower wages year after year, till now some of them do two, three or four times as much to earn a dollar of profit as in 1874 and earlier.

CROPS AND THE RAILROADS.

The total crops for 1883 were estimated recently by the New York *Evening Post* and compared with the reported crops of several previous years. It is somewhat dangerous to estimate any of this year's crops yet except the winter-wheat crop, though one may not be far out of the way with the spring wheat. The *Post* estimates the total wheat at 416 millions, which will not be very far from the truth. The estimate of 1,700 millions for corn is probably too sanguine, even if there is no more destruction by frost, from which we shall not be safe until after the end of this month. Moreover, in a very large part of the corn-growing country, corn was suffering from drought when the frost came. We should say that 1,700 millions is the maximum estimate for corn, with 1,600 more probable, even with no more frost. The condition reported by the Department of Agriculture Sept. 1 indicated in the seven great corn states a production of 1,055 millions of bushels, which is just 100 millions more than their production last year. But in the South the crop is perhaps 75 millions less than last year, and probably from 50 to 75 millions were destroyed by the frosts, and last year's crop was 1,617 millions.

Thus the loss in the South had already brought down the prospects Sept. 1 to about last year's production, assuming the estimates of condition to have been correct. But all these estimates must be somewhat rough, and it will be only some time after the crop is all ripe that we shall be able to say pretty nearly what the corn crop is.

It would appear, however, that the seven corn states promised a much larger crop Sept. 1 than in 1882 or 1881, the prospect this year and the production in the four previous years being:

	1879.	1880.	1881.	1882.	1883.
1,201,841,211	1,046,004,300	737,759,000	935,595,800	1,055,700,000	

Now, the destruction by frost in these states was perhaps 25 millions, certainly not 50 millions, so that the prospect is for a larger crop in them than last year, a third more than in 1881, nearly as much as in 1880, but a sixth less than in 1879. To these states and the railroads in them and to most of the carriers in the country a failure of corn in other states is an advantage rather than otherwise, as these seven corn states always have to be drawn upon to meet any demand for corn, being the only states that produce a surplus of considerable amount. The killing of corn in Michigan, Wisconsin and Minnesota means that the lumber camps and Lake Superior mining regions, not being able to get their supplies of corn and pork from Southern Michigan, Wisconsin and Minnesota, will send further South for them, to Iowa, Illinois, etc. The reduced crop in the South means greater importation, of course, from the Northwest. What is a misfortune to one locality and to the country at large is not so to the locality which has surplus corn: and, with no further damage to corn, the railroads in the seven great corn states and their connections with the East and South are likely to have a larger corn traffic from the present crop than last year or the year before.

The *Evening Post* estimates the oat crop at 600 million bushels. The yield was exceptionally good last year, and then the crop was 488 millions. There is an increase in acreage this year of 4 per cent., and an excellent crop everywhere in the North, but the yield per acre would have to be 19 per cent. greater than last year to make the crop 600 millions. It is much more likely to have been 550, or even 525 millions. We should say, then, that the *Post* has overestimated the corn crop probably 100 millions, and the oat crop at least 50 millions. Accepting 416 millions for wheat, and rye and barley the same as last year, we will have 2,695 million bushels of grain of all kinds, comparing as follows with the production of previous years (in millions of bushels):

	1879.	1880.	1881.	1882.	1883.
2,686	2,704	2,634	2,668	2,695	

This makes the total very nearly the same in all five of these years except 1881, when it was a fourth less. To many this may seem satisfactory; but a stationary agricultural production is really something more than stagnation in this country, in which all other industries and population are increasing with great rapidity, and all depend on agriculture, as there is no considerable foreign market for any other of our productions, except petroleum and precious metals.

Now the population June 30 in these years has been, in thousands:

	1879.	1880.	1881.	1882.	1883.
48,723	50,155	51,827	53,652	55,324	

Which gives the production in bushels per head of population:

	1879.	1880.	1881.	1882.	1883.
55.1	53.9	39.6	50.1	48.7	

This makes the proportion per individual not quite 3 per cent. less than last year, nearly 10 per cent. less than in 1880, and 11.6 per cent. less than in 1879, but 23 per cent. more than in 1881.

But there is one thing that has increased much faster than the population even since 1879 that is greatly dependent upon the crops, both directly and indirectly, namely, the railroads. The mileage of these in the middle of successive years has been (nearly):

	1879.	1880.	1881.	1882.	1883.
82,853	87,891	94,559	107,037	115,667	

And the grain production per mile of railroad has been:

	1879.	1880.	1881.	1882.	1883.
32,426	30,760	21,513	25,125	23,216	

The crop of 1879 was one of the best, if not the best, ever produced in this country, the yield of almost everything being far above the average. It gave the railroads extraordinarily good traffic. The production last year was nearly the same in amount, but it did not make heavy traffic on the railroads, because there were so many more of them. This year the probabilities seem to us to be that the crop is no larger, but if it is, the average per mile of road is 28 per cent. less than in 1879, and only 8 per cent. more than in the disastrous crop year 1881. Even if the production is 150 million bushels more this year, it is but 24,520 bushels

per mile of railroad, and is 25 per cent. less than in 1879.

In the same time there has been an enormous increase in nearly all manufacturing industries, in some, as in blast-furnaces, greater than in railroads even, all of which find substantially their sole market in this country. Their business as well as railroad business is ultimately dependent on the crops; if there is no growth in agricultural production, they cannot continue to grow. It is for this reason that we say that to produce as much in one year as in previous years is not doing as well as in those years. The production which makes a "boom" in one year is followed by stagnation in another, and still later, if railroads and factories continue to increase, by disaster. It has all along been absolutely certain that railroads could not continue to increase as in the past three years without disaster to themselves. The population per mile, which was 588 in 1879, has fallen to 477 this year, though meanwhile the country has grown with even more than its average rapidity, because of the great immigration. This reduction in the number of inhabitants per mile of railroad means that there is more railroad property for each individual to pay interest on, if it is paid at all; and as the addition to the railroad has been made without any increase in grain production, with very little increase (this year) in cotton production, and with a decrease in hogs which will perhaps balance, or nearly so, the increase in cattle and sheep, it means that the railroads as a whole must depend chiefly on the growth of industries other than agricultural to support the vast addition to them (28 per cent.) since 1879.

There has been all along a considerable growth of agricultural industry, and that production has not increased is due to lighter average yields than the exceptionally heavy ones of 1879. The acreage of grain and cotton has increased just about 2 per cent. yearly. If business is not so good now as after the harvest of 1879, it is not so much because there has been too little growth in agriculture as because there has been too great growth of railroads.

Erie Earnings and Expenses.

The statement of Erie earnings for May, we said last week, had nothing in it to indicate whether it included the earnings and expenses of the New York, Pennsylvania & Ohio. We were entirely wrong. It says plainly "including earnings and expenses of leased lines." Our mistake arose from examining a printed copy instead of the official statement. The inclusion of these makes a direct comparison with the old Erie earnings without significance, of course, and we have therefore in the following made our comparisons with the aggregate earnings and expenses of the Erie and the New York, Pennsylvania & Ohio.

The aggregate gross and net earnings and working expenses of the Erie, and the New York, Pennsylvania & Ohio in May for six successive years have been:

Year.	Gross earnings.	Expenses.	Net earnings.
1878.....	\$1,460,378	\$1,165,569	\$294,779
1879.....	1,067,617	1,346,050	327,567
1880.....	1,911,988	1,250,419	681,569
1881.....	2,447,250	1,391,287	855,972
1882.....	2,154,572	1,341,560	813,012
1883.....	2,055,988	1,424,933	631,055

The net earnings of the New York, Pennsylvania & Ohio have fluctuated greatly, going as low as \$14,500 in one month (June, 1879), and as high as \$238,000 (in September of last year). Much the largest net earnings it has ever had were in the last half of last year; it only reported for one month of this year before the lease, but then (April) its gross earnings were \$463,678, and \$13,343 more than last year. For May we see that the aggregate gross earnings of the two roads were nearly 5 per cent. less than last year and 16 per cent. less than in 1881, and their net earnings were 22.4 per cent. less than last year, 26 per cent. less than in 1881, and even 7.4 per cent. less than in 1880.

The addition to the Erie's fixed charges due to the lease of the New York, Pennsylvania & Ohio is about \$146,000 per month. It must pay not less than the net earnings of last year, which were \$1,757,055, most of which, however, went for taxes, hire of rolling stock, rental and prior lien mortgage interest, and most of these will come out of the rental to be paid by the Erie also. Allowing for this rental, the Erie's net earnings available for other purposes than the rental of the New York, Pennsylvania & Ohio were about \$485,000 last May, which is very much less than in any previous May since 1879, and is hardly equal to the average monthly charges for rental, interest, etc., but is larger than the net earnings of any previous month since November, except March, when they were \$507,000. About two-thirds of the net earnings of the New York, Pennsylvania & Ohio last year were made in the last half of the (calendar) year; and the net earnings of the Erie in the last four months of the last fiscal year were at the average rate of \$743,123, against \$489,399 in the first eight months. There were special causes to make the earnings much smaller in the first half than in the last half of last year which do not apply this year.

It is usual, however, for this road to have more than its average earnings in the last third of its fiscal year—the part not yet reported. The earnings in the first eight months

(October to May) and the last four months (June to September) for four years past have been:

	1878-79	1879-80	1880-81	1881-82
Oct. to May.....	\$3,007,612	\$4,359,451	\$4,796,683	\$3,915,191
June to Sept.....	1,759,713	2,689,732	2,662,692	2,972,490
Per cent. in last 4 months.....	36.9	38.2	35.7	43.2

Thus in all these years more than a third of the profits have been made in the last third of the fiscal year, but last year a much larger proportion than in any other. The condition of traffic does not indicate that this last third will be more productive this year than in the average year; if not, then about three-eighths of the total net earnings of the Erie proper were made since May, which would make its net earnings about \$6,120,000. The road has carried an unusually large proportion of the east-bound freight since May, it is true, but we have showed heretofore that the quantity of grain it has brought to New York is little more than last year, and it has had the Lackawanna diverting local traffic from 200 miles of its road this year for the first time. Quite possible there has been an increase on the New York, Pennsylvania & Ohio, which has had traffic brought to it from the West by the new Chicago & Atlantic and has not lost what came by its old Chicago connection, the Chicago, St. Louis & Pittsburgh.

For the first eight months of the fiscal year the gross and net earnings and expenses of the Erie, including those of the now leased New York, Pennsylvania & Ohio, for May only in all the years, have been, for six successive years:

	Gross earnings.	Expenses.	Net earnings.
1877-78.....	\$10,731,514	\$7,544,617	\$3,186,897
1878-79.....	10,812,394	7,763,002	3,049,392
1879-80.....	12,403,673	7,982,591	4,421,112
1880-81.....	14,096,816	9,141,126	4,955,690
1881-82.....	13,118,245	9,042,401	4,075,844
1882-83.....	13,439,154	9,451,462	3,987,692

The gross earnings are \$321,000 more than last year, but \$658,000 less than in 1881; the net earnings are the smallest since 1879, but only \$88,152 (2 1/4 per cent.) less than last year.

The Erie this year has several new enterprises from which it obtains traffic and for which it incurs some obligations. Besides this leased New York, Pennsylvania & Ohio, it is liable for the whole amount of its gross earnings from traffic interchanged with the new Chicago & Atlantic road if that road's net earnings are not sufficient to pay the interest on its bonds. The interest is \$390,000 per year, and the road has to pay rental for the Chicago & Western Indiana, which gives it 19 miles of road for an entrance into Chicago and its stations, etc., in that city. As the road was not opened until the middle of May, it may very well happen that it may not earn its interest this year. These and the other new enterprises, like all new enterprises, are likely to be less profitable the first year than afterward.

John C. Trautwine.

This eminent engineer, after a long and eventful career, died in Philadelphia in his seventy-fourth year on Friday, Sept. 14. He was born in that city March 30, 1810. After receiving an ordinary education he entered the office of William Strickland, and was engaged on the Delaware Breakwater. Later he was employed on the construction of the Philadelphia, Wilmington & Baltimore and the Hawssee railroads. In 1844 he began a five years' engagement on the Canal del Dique, in New Granada. In 1849 he was engaged on the Panama Railroad as Chief Engineer, and later he made a survey for the Atrato Inter-oceanic Canal, and in 1857 he surveyed the route for the Honduras Inter-oceanic Railway, a line that was never built.

He is and will be best known, however, by his writings, which have run through several editions. His book on "Railroad Curves" is the simplest and clearest book on the subject in the English language. He also wrote a book on "A New Method of Calculating the Cubic Contents of Excavations and Embankments by the aid of Diagrams." The work, however, on which his reputation will chiefly rest is his "Civil Engineer's Pocket Book." It is a monument to his industry and versatility, and is perhaps the best single treatise on civil engineering thus far published. Owing to the time when Mr. Trautwine studied and learned engineering, his book was, even at the time of its publication, somewhat behind the times. It has fallen still further behind now, but it would be difficult to find any other one book which alone would be as useful to a young student of civil engineering as this.

While engaged in work in tropical countries Mr. Trautwine contracted one of the malignant fevers so prevalent in these climates, from the effects of which he never recovered entirely, and which finally caused his death.

He was a prominent member of several scientific societies. He leaves two sons, William Trautwine, a conveyancer, and John C. Trautwine, Jr., who has been engaged with his father in his book work.

Record of New Railroad Construction.

This number of the *Railroad Gazette* contains information of the laying of track on new railroads as follows:

Buffalo, New York & Philadelphia.—The *Olean & Salamanca Branch* is extended from Tuna Crossing, N. Y., eastward to Olean, 12 1/2 miles.

Georgia Pacific.—Extended from Coosa River, Ala., west to Cane Creek Tunnel, 12 miles. Gauge, 5 ft.

Louisville, New Orleans & Texas.—Track laid from Memphis, Tenn., south to Dogwood Ridge, 14 miles.

New York, West Shore & Buffalo.—Extended from Bowmansville, N. Y., east to Akron, 10 1/2 miles.

Pennsylvania.—Track is laid on the *Ridgway & Clearfield Branch* from Ridgway, Pa., southward to Brockwayville, 22 miles.

Pittsburgh, Cleveland & Toledo.—Extended eastward to Leavittsburg, O., 3 miles; also, from Struthers, O., northwest 5 miles.

St. Louis & San Francisco.—Extended from Eureka, Mo., eastward 24 miles to the outskirts of St. Louis.

This is a total of 103 miles of new railroad, making 3,687 miles thus far this year. The total new track reported in our columns to the corresponding date for 12 years past has been as follows:

	Miles.		Miles.
1883.....	3,687	1877.....	1,335
1882.....	7,164	1876.....	1,599
1881.....	4,474	1875.....	761
1880.....	3,539	1874.....	1,082
1879.....	2,064	1873.....	2,691
1878.....	1,245	1872.....	4,765

The statements include *main track only*, no account being taken of second tracks or other additional tracks or sidings.

The mileage reported is now a little over half that of last year. It was exceeded in 1881 and 1872, and very nearly equaled in 1880.

THE REPORT OF THE COMMISSIONER OF PATENTS FOR 1882 has just been issued and contains, as usual, some interesting facts. The excess of receipts of the Patent Office over expenditures for 1882 was \$325,351.78. This, with the balance in the Treasury of the United States on account of the patent fund, now amounts to \$2,205,471.10.

The number of applications for patents for inventions for the year 1882 was 30,270. The total number of applications for patents, including designs, reissues, caveats, etc., was 36,114. The total number of patents granted and certificates issued, including those for designs, trademarks, reissues, etc., was 20,518, so that a little more than one-half of the applications are granted.

According to the statistics in the report the people of Connecticut are the most ingenious in the country, as more patents are issued to its citizens in proportion to population than to those of any other state. The proportion of patents issued to the population of that state was 1 to every 752. Rhode Island comes next, with 1 to 980, then Massachusetts, 1 to 982. Excepting the District of Columbia, New York comes next, with 1 to 1,345. The least inventive state is Alabama, which received only one patent to 27,445 of its people; the proportion in South Carolina was 1 to 22,123, and in Mississippi, 1 to 20,207. To a great extent invention seems to be a matter of latitude. A cold climate seems to favor it, and warm weather has the reverse effect.

There were 348 patents granted for car-couplings during this year, 28 for stock cars, 17 for car-wheels, 368 patents relating to electrical apparatus of different kinds, 44 relating to locomotives, 67 for nut locks, 36 for railroad signals, 14 for station indicators, and 25 for balanced valves.

CHICAGO THROUGH RAIL SHIPMENTS EASTWARD, by the complete report of the eight roads, have been as follows in the first week of September for the past four years:

	1880.	1881.	1882.	1883.
Tons.....	39,051	63,144	38,106	46,947

The shipments this year were thus larger than in any other except 1881, when they were made great by war rates, which diverted lake shipments to the railroads, and they were 28 1/2 per cent. more than last year and 20 1/4 per cent. more than in 1880, when rates were a fifth higher. The shipments were the largest since March, and the largest there ever have been when lake navigation was opened and rates were maintained, except in June, 1880, and just before navigation closed in other years. Of the shipments this year, however, 11,484 tons went by the new roads, leaving to the six old ones less than in any of the other years.

The percentages of the total shipments that went by each road this year and last in the first week of September were:

	C. & G. T.	Mich. Cen.	Lake Shore	Fort Wayne	C. St. L. & P.	B. & O.	Chic. & At.	N. Y. C. & St. L.
1883.....	8.7	13.7	14.4	20.0	12.1	6.6	17.2	1.3
1882.....	13.5	25.4	15.4	27.3	13.3	5.1	17.2	1.3

The proportion of the Chicago & Grand Trunk is exceptionally small this year, doubtless because of diversions for the purpose of reducing its excess. The Chicago & Atlantic gets more than any other road except the Fort Wayne. The Chicago, St. Louis & Pittsburgh is but little above the old pool proportion, and much below what it has recently carried. The two Vanderbilt roads, which before the advent of the Chicago & Grand Trunk were awarded 49 per cent. of the total Chicago shipments, in this first week of September carried but 28.1 per cent.

For five successive weeks the total Chicago shipments have been:

	Aug. 7.	Aug. 14.	Aug. 21.	Aug. 28.	Sept. 4.
Tons.....	33,487	32,432	38,500	39,105	46,947

In July the average weekly shipments were about 30,000 tons; in June about the same. An increase is to be expected at this season. There has been one every year, not excepting 1881; but both last year and in 1880 there was a falling off after the first week of September.

For the week ending Sept. 15 the incomplete report of eastward shipments, through and local, of flour, grain and provisions shows a total of 49,624 tons, against 29,812 tons in the corresponding week of last year and 40,994 tons in the previous week of this year. The complete report will probably show several thousand tons more, as it showed nearly 6,000 tons more in the first week of September. This being the first week after the meeting of the Joint Executive Committee and its action against cutting rates, there is special interest in the percentages reported, though

these will doubtless be changed somewhat by the official report. There is a considerable decrease from the previous week in the percentages carried by both the Chicago & Atlantic and the Chicago, St. Louis & Pittsburgh, the chief feeders of the Erie. Together they had 25.2 per cent. of the whole last week against 32.9 the week before, the Chicago & Atlantic losing 2.7 per cent. and the other 5; but the quantity carried by these two roads, which was 13,492 tons in the first week of September, fell only to 12,483 in the second week, the total shipments were so much larger. The tons and percentages reported in this incomplete statement for these two weeks were:

	Tons.	Per cent.	Tons.	Per cent.
	Week to Sept. 8.	Week to Sept. 15.	Week to Sept. 8.	Week to Sept. 15.
Chicago & Grand Trunk.....	4,982	5,835	12.2	11.8
Michigan Central.....	4,521	5,916	11.0	11.9
Lake Shore.....	6,117	9,384	14.9	18.7
Fort Wayne.....	6,096	7,314	14.8	14.8
Chic. St. Louis & Pitts.....	6,332	5,133	15.4	10.4
Baltimore & Ohio.....	2,903	2,855	6.4	6.0
Chicago & Atlantic.....	7,180	7,350	17.5	14.8
N. Y., Chicago & St. Louis.....	3,213	5,737	7.8	11.6
Total.....	40,904	49,624	100.0	100.0

The Michigan Central and the Fort Wayne, which have formerly carried more than any other road, and are not exceeded by any in capacity to handle traffic when there is a pressure, remain very far below their old rank. The only considerable gains in percentages in the second week over the first are by the Lake Shore and the Nickel Plate, which carried 30.3 per cent. of the whole instead of 22.7, and the only considerable losses are by the two Erie feeders, before mentioned, notwithstanding which the Chicago & Atlantic carried a greater quantity in the second week, and more than ever before. It has been reported that it was not able to carry all that was offered it, and it is regarded as significant that some shippers which could not get their freight taken by it refused to ship by other roads. It is probable, however, that if shippers have been given special rates or rebates, the rates to them could not be advanced immediately.

A LEASE OF THE BOSTON & LOWELL TO THE GRAND TRUNK is talked of as if it were seriously under consideration. The Grand Trunk has a great Boston business in both directions, and it reaches Boston from Montreal by the Central Vermont, the Northern of New Hampshire and the Boston & Lowell, the latter working only forty miles of the 334 miles to Montreal and the 1,171 to Chicago. Only 26 miles of the line between Montreal and Boston is worked by the Grand Trunk, while 164 belong to the Central Vermont, 69 to the Northern, 35 to the Concord and 40, as we have said, to the Boston & Lowell. The fragmentary character of this line reminds us of what the New York Central was between Albany and Buffalo before the consolidation. But the Boston & Lowell is unlike the others because of its furnishing the seaboard and city terminus, much more important than a haul over the whole length of its road, and indispensable to the command of a large city and export traffic. The facilities at the terminus must be of the best character if traffic is to be held, and they cost millions—much more than any road would be justified in expending simply for the sake of the profits of through traffic over 40 miles of road. To make it worth the while of so short a road to provide an adequate terminus for a line 1,200 miles long it must be allowed a terminal charge which will yield it a profit. This is not always easy to manage or to adjust among the roads in the line. The long line needs to own the seaboard terminus. It was this more than anything else which finally forced the Pennsylvania Railroad Company to lease at a very high rental the United Railroads of New Jersey, though the latter had nearly 500 miles of road to support its Jersey City terminus, while the Boston & Lowell has but 140 to support its Boston terminus.

But it would seem a strange thing for the Grand Trunk to lease the Boston & Lowell, leaving 294 miles of road intervening between it and its own road. It needs not only a Boston terminus, but the whole of a line to Boston under its own control. But with a Boston terminus it would control contracts in both directions, while now the contracts for shipments westward are made by roads having but a very small interest in the earnings.

It is said that such a lease would mean the abandonment of Portland by the Grand Trunk. But it cannot abandon Portland, for it has a perpetual lease of the Atlantic & St. Lawrence Railroad, by which it reaches it. It might give up subsidizing steamers to sail from that port in winter, and, judging by the very small export trade of Portland, neither it nor Portland would have much to lose by this. Breadstuffs to the value of \$213,032 were exported thence in the year ending with June, 1882, and to the value of \$217,540 in the following year, out of totals from the United States of 177 and 203 millions, respectively—less than the average export per day from New York, and about one-seventieth of the Boston exports. It does somewhat better with provision exports, for the nine months ending with July shipping one-twelfth as much as Boston this year, and one-fifty-third the New York exports. The Portland business does not increase, either. Its receipts of grain and flour for six successive years have been, in bushels:

	1877.	1878.	1879.	1880.	1881.	1882.
Tons.....	2,738,215	4,025,037	2,381,504	3,676,101	2,890,219	1,729,916

With a road to Portland which it must work and pay rental for, the Grand Trunk will be pretty sure to utilize whatever commercial advantages that place offers, however.

NEW YORK CENTRAL EARNINGS for the fiscal year ending with this month have been estimated by some one who seems to gain credence at \$33,318,946. It looks strange to see these odd dollars in an estimate; but a glance at the

gross earnings in previous years will show the method by which this estimate was made. The largest earnings heretofore were in 1879-80, and were \$30,818,946, and the curiously exact estimate is evidently due to "estimating" that the earnings would be \$3,000,000 more this year than ever before. But we should say that it is more probable that the earnings this year will be \$3,000,000 greater than last year, and last year they were but \$27,249,797. The road gained greatly in the first quarter of its fiscal year, without doubt; but July and August it can hardly have done as well as last year. September may turn out very good, but it was very good last year.

The same report says that the working expenses will be about 67 per cent., against 59 per cent. in 1880, and a criticism is made on this report that there has been no advance in the price of materials and labor, and therefore there cannot well have been any considerable increase in expenses.

These comments must have been made by some one not accustomed to read reports, of expenses. That is a point on which the course has been almost uniform. Expenses began to increase in 1880, but the increase that year was insignificant compared to what it has been since. We give below a comparison of the expenses of certain roads which have not changed their mileage greatly in 1880 and 1882, or the year nearest to these:

	1882	1880	Increase	P. c.
New York Central.....	\$19,305,974	\$17,861,535	\$1,534,439	8.6
Erie.....	13,088,004	11,643,925	1,444,169	12.4
Pennsylvania.....	30,647,406	24,293,704	6,353,702	26.1
Boston & Albany.....	5,600,901	5,248,501	352,400	6.7
Lake Shore.....	11,057,807	10,418,105	639,702	6.1
Michigan Central.....	6,671,726	5,738,751	932,975	16.3
Chicago & Alton.....	4,485,881	4,061,824	424,057	10.4
Chic., Rock I. & Pac.....	7,322,892	5,796,546	1,526,346	26.3

Some of these roads certainly exercised extraordinary economy in 1882, because of very bad earnings, while in 1880, on the other hand, long-delayed renewals were made because of a great increase in profits. Yet in spite of everything expenses have increased, and on most roads they are increasing still. The Erie has just reported an increase of 4½ per cent. in expenses for the first eight months of its fiscal year; the Chicago, Burlington & Quincy for the first seven months of 1882 an increase of 15 per cent.; the Pennsylvania for the same period an increase of 8.9 per cent.; the Northern Central an increase of 7 per cent. There are some exceptions, as there always are. Roads that have had exceptional renewals for a year or two or more may need so little in a following year as to make a great decrease in expenses while generally expenses are increasing, and a vast amount can be "saved" temporarily by a process of starving which has to be paid with interest thereafter, to be sure, but is resorted to not very infrequently when depreciation of credit seems more dangerous than depreciation of road.

THE LARGEST NORTHWESTERN GRAIN RECEIPTS ON RECORD are those of the week ending Sept. 8 last, amounting to 9,805,091 bushels. The largest receipts heretofore were 9,393,826 bushels, in the last week of July, 1880. The first week in the history of the trade when the receipts reached 9,000,000 bushels was in August, 1878. There was no other week in that year when the receipts reached that amount, and none at all in 1879, but in 1880 there were four such weeks, three in succession ending Oct. 16. From that time until the last week of August this year there was again no week when as much as 9,000,000 bushels were received.

The heavy receipts this year are not mainly due to the movement of this year's crop, but largely to the movement of last year's corn crop. This was the week at the end of which the frosts came. If much damage was done by these frosts we shall be pretty sure to see it in reduced receipts in the week ending Sept. 15. But though wheat was not the main part of the receipts in the first week of September, it was a larger amount than in any previous week of this season, and larger than in any corresponding week since 1879 at least. The receipts of oats are, however, extraordinarily large, and it is by large, though not the largest, receipts of all three of these grains that the total receipts have been made larger than ever before. The spring wheat of Nebraska and Iowa has doubtless begun to come forward, but it cannot have made much of a figure yet, as wheat receipts at Chicago, though larger than heretofore, are not very large, and most of the wheat of these states goes to Chicago. Soon the Minnesota and Dakota wheat will be coming to market, and we shall then see an increase of wheat receipts not only at Chicago but at Milwaukee, which has been getting very little for a long time past. Considering that Milwaukee used to stand next to Chicago in grain receipts, and not infrequently ahead of it in wheat receipts, it seems strange that in the first week in September it received but 231,387 bushels, while Chicago had 5,968,061.

The imperfect report of Chicago grain receipts, which usually varies but little from the complete report, however, shows for last week 5,016,000 bushels, or about 790,000 bushels less than the week before. In corn there is a decrease from 3,069,766 to 2,544,000 bushels, probably due chiefly or wholly to the frost. Receipts from Northern Illinois and Iowa are said to have decreased, while from Nebraska and Kansas they have increased.

REGULATING STEAMBOAT RATES has, we believe, never been attempted in any of the states that restrict railroad rates, except California. There, in a case in which the authority of the State Railroad Commission to regulate rates between California ports, the United States Circuit Court decided this week that all sea-going vessels are under the jurisdiction of the United States, and beyond the con-

trol of the separate states. It may be inferred from this that the Commission's power to regulate rates on river steamers is not disputed by the court.

It may seem very unjust to submit the railroads to restrictions from which steamers, which may be their chief competitors, are free. The theory on which the policy of restriction is based, however, does not apply to navigation either at sea or on inland waters which are open to all. Competition is at all times and at short notice possible on these water-ways, and the means of transportation may be quite closely adjusted to even temporary fluctuations in traffic, because if at any time traffic is unusually profitable on a route, any owner of a vessel suitable for the trade may take it from a less profitable route and put it on this; and if the business becomes unprofitable afterward, he may take his vessel off the route with no sacrifice of capital. To enter into competition for a very profitable railroad traffic, on the other hand, requires a very large expenditure of capital which cannot afterward be withdrawn, and cannot be made in a short time. If there are ten steamers on a route, and the traffic grows 10 per cent., the demand can be supplied by a competitor with one steamer; but a competitor must build a whole railroad all at once, at a cost not much less than that of the existing line, in order to carry any part of the traffic; while the old road can accommodate an increase usually with no other expenditure than that for additional rolling stock, or, if the increase is great, of some additional sidings or an additional track, at a small fraction of the cost of the cheapest new road. It is thus much more difficult and involves greater risks to enter into competition with an established railroad than with an established steamboat line. This, however, by no means makes it just to give to public officers, who are substantially the agents of the customers of the railroads and steamboats, the power to fix the rates of either.

A RAILROAD COMMISSION BILL passed last week by the New Hampshire Legislature was vetoed by Governor Hale for reasons entirely connected with the sections relating to the appointment of the commissioners. One of these provided that they should be elected by the Legislature of the state, and this the Governor regarded as an anomaly in a state where the officers are either elected by the people or appointed by the Governor and Council. The objection to the bill upon which he chiefly dwelt in his veto message, however, was a requirement that of the three commissioners one should be "learned in the law," and another should be a civil engineer, "learned and skilled in his profession." This apparently reasonable provision, which was copied from the commission laws of several other states, the Governor holds to be an infringement upon the right secured by the constitution of the state to all its citizens to be elected or appointed to office. He thinks that a lawyer might not be the best man for the position, and he even suggests that there might be in the state only one civil engineer "learned and skilled in his profession," and in that case the appointing power would be deprived of its natural right of selection, and the fortunate engineer would be legislated into office. In other words, the Governor seems to fear that the simple provision requiring that two members of the commission shall possess some knowledge which may be supposed to fit them to act intelligently upon the questions likely to come before them will endanger the democratic nature of New Hampshire institutions by the creation by law of an aristocracy, the distinguishing mark of which should be eligibility to a railroad commissionership. The Legislature seemed to be impressed by the views contained in the message, however, and a new bill was promptly passed with the necessary changes, and was signed by the Governor.

THE COLORADO PASSENGER TRAFFIC has fallen off tremendously since last year, as shown by a statement published of the passenger earnings of the railroads in the Colorado pool for the first half of the year, as follows:

	1883	1882	Decrease	P. c.
Union Pacific.....	\$328,129.62	\$710,297.01	\$382,167.39	52.4
Atch. & Top. & Santa Fe.....	206,263.27	408,503.74	202,240.47	49.5
Burl. & Mo. River.....	189,555.82	not open
Total.....	\$723,948.71	\$1,118,740.75	\$394,792.04	35.3

We have heretofore called attention to the fact that all the roads in the Far West were suffering decreases, though the Union Pacific and the Atchison must have had a much heavier crop movement on their lines east of the 100th meridian than the year before, the crops of 1882 having all been magnificent, while those of 1881 were all bad. This immense falling off in the passenger traffic between the Missouri River and Colorado shows that there must have been a bad Colorado traffic, which the decline in all earnings of the Denver & Rio Grande, whose whole great system is in Colorado, has also indicated. Such a decline is extremely uncommon in passenger earnings in this country, though not in freight earnings. Passenger traffic here usually does not increase fast, it is true, but it does not grow smaller fast either.

The entrance into Denver by the Chicago, Burlington & Quincy seems not to have affected the business very greatly, but of course it aggravated the misfortune to the other two roads. We may say that first there was a decrease of \$394,800 in the total traffic, and then the Burlington came in and took \$189,500 of what was left, so that the two old roads suffered a reduction from \$1,118,740 to \$544,492, or more than 50 per cent. The Union Pacific had 45½ per cent. of the whole this year, the Atchison 28½ per cent., and the Burlington 26½ per cent. Last year the Union Pacific had 63½ per cent. and the Atchison 36½ per cent. of the whole.

STEEP GRADES have been used on some railroads in Arizona constructed by a correspondent who briefly describes them. In fact, "railroads" seems a misnomer, and they might almost as well be called "elevators." The largest of these rises 1,100 ft. in a length of track of 3,000 ft., in which, however, but 2,790 ft. of horizontal distance is made, making the grade nearly 40 per cent., or about 2,100 ft. per mile; another exceeds this, however, a track 1,500 ft. overcoming an elevation of 700 ft., which is at the rate of 2,770 ft. per mile (52½ per cent.); and a third, which rises 580 ft. in going 1,200 ft.

THE SCRAP HEAP.

Pulling a Tooth by Steam.

"Dummy" is a deaf mute newsman on the Long Island Railroad. Lately he has suffered much in mind and body from an aching tooth. He did not like dentists, but he resolved that the tooth must go. He procured a piece of twine and tied one end of it to the tooth and the other end to the rear of an express train. When the train started Dummy ran along the platform a short distance and then dropped suddenly on his knees. The engine whistled, and Dummy whooped. The train took the tooth where all bad teeth go—to Long Island City.

Men and Women.

The Boston & Albany Railroad no longer has "Gentlemen's Rooms" and "Ladies' Rooms" at its stations. They are now inscribed "Men's Room" and "Women's Room."—*Boston Advertiser*.

The same change, it is said, is to be made in other Boston passenger stations.

A Narrow Escape.

The engineer on a west-bound freight train in crossing the Trinity River bridge last night felt the bridge sinking under his train. An examination was made and it was discovered that one of the bents or piers had gotten out of position, letting down the three stringers attached to it and leaving no support for that portion of the track immediately over it. The discovery was just made in time to save the west-bound passenger train, which had a big trip, all the coaches being full. A bridge gang was telegraphed for at Forney, the bridge was repaired and the passenger train went over it about daylight. The Texas & Pacific has been contemplating making repairs on this bridge for some time as it is getting old and dangerous. The chances are that the passenger train would have gone through the bridge if the freight had not gone ahead and given warning, and the loss of life would have been terrible, as it is about the longest and highest bridge on the line.—*Fort Worth (Tex.) Gazette*, Sept. 10.

A Haunted Locomotive.

From time to time hints have been thrown out concerning the haunted engine of the Detroit, Lansing & Northern Railroad. Of late so much has been said that a Detroit *Free Press* correspondent determined to inquire into the matter. The engine (No. 20) is run at Edmore as a yard engine, by Cal. Platt, from whom it was learned that the locomotive has been the means of causing the death of several people, and only last spring ran over and killed a man near Portland. The side which has run over the bodies keeps up a constant groaning, and moans like a human being in distress. It has been oiled, and everything done to stop this noise, but it has no effect whatever. The latest freak in which it has indulged occurred one day last week. The engine was standing on the track and the engineer standing beside it, but no one touching any part of the machinery, when the bell commenced ringing and continued for several seconds. Several persons standing by witnessed this, and say they would swear that it was a fact. Engineer Platt says he is not naturally superstitious, but he doesn't know what to make of it.

General Railroad News

MEETINGS AND ANNOUNCEMENTS.

Meetings.

Meetings will be held as follows:

Lake Erie & Western, annual meeting, in LaFayette, Ind., Oct. 10.

Louisville & Nashville, annual meeting, at the office in Louisville, Ky., Oct. 3. Transfer books close Sept. 20.

Ohio & Mississippi, annual meeting, at the office in Cincinnati, O., Oct. 11. Transfer books close Sept. 21.

Western Union Telegraph Co., annual meeting, at the office in New York, Oct. 15.

Dividends.

Dividends have been declared as follows:

Buffalo, New York & Philadelphia, 1½ per cent., quarterly, on the preferred stock, payable Sept. 25. Transfer books close Sept. 21.

Chicago, Milwaukee & St. Paul, 2½ per cent., semi-annual, on both preferred and common stock, payable Oct. 15. Transfer books close Sept. 26.

Nashville, Chattanooga & St. Louis, 2 per cent., payable Oct. 1. The last dividend was 1½ per cent., paid April 20, 1882.

New York, Lackawanna & Western (leased to Delaware, Lackawanna & Western), 1½ per cent., quarterly, payable Oct. 1.

Oregon & Transcontinental Co., 1½ per cent., quarterly, payable Oct. 15. Transfer books close Sept. 25.

Railroad and Technical Conventions.

The American Street Railway Association will hold its next meeting in Chicago, Oct. 9.

The American Institute of Mining Engineers will hold its autumn meeting in Troy, N. Y., during the second week in October.

The General Time Convention will hold its fall meeting at the Grand Pacific Hotel in Chicago, Oct. 11.

The Southern Time Convention will hold its fall meeting at No. 46 Bond street, New York, Oct. 17.

The American Association of Railroad Superintendents will hold its fall meeting in Washington, Oct. 23.

The American Society of Mechanical Engineers will hold its annual meeting in New York, in the week ending Nov. 3.

Brotherhood of Locomotive Firemen.

The tenth annual convention of the Brotherhood of Locomotive Firemen began in Denver, Col., Sept. 17, with 180 delegates present. The meeting is expected to last all this week.

New York Railroad Commission.

A special meeting of the New York Railroad Commission was held in New York, Sept. 18, to hear remonstrances against the recent order requiring the railroad companies

to make quarterly reports. After hearing several officers of the New York Central & Hudson River and the New York, Lake Erie & Western companies, the Commission stated that if it should be decided to reconsider the order a full hearing would be had in Albany.

National Association of General Passenger and Ticket Agents.

The regular semi-annual meeting of this Association was held in Chicago, Sept. 18. The first day was devoted chiefly to a discussion on maintaining rates, and a resolution in favor of a general return to the former schedule rates was finally adopted by a vote of 53 out of 68 present, 15 members refusing to vote.

On the second day winter tourist rates were under discussion, and it was resolved to place tickets to Florida points on sale Oct. 15, at 4½ cents per mile for round-trip and 2½ cents for single tickets, the tickets to be good for six months.

A committee of 15 was appointed to consider the practicability of establishing a rate bureau, having such jurisdiction as may be agreed on, and authority to make all through rates for the whole country. This committee is to report at the next semi-annual meeting. The convention adjourned on the afternoon of Sept. 19.

New England Railroad Club.

The first regular meeting of this club for the season was held on the evening of Sept. 12 at the club rooms in Boston. Quite a large number were present.

The President, Mr. F. D. Adams, being absent, the meeting was called to order by the Vice-President, Mr. J. W. Marden, who referred to the club excursion, which was given Aug. 22.

Report of the proceedings of May meeting was read by the Secretary, and approved. Some little discussion upon car roofs for freight cars was engaged in, the given opinion being that good "M. F." tin was as good a covering for roofs as could be found.

The subject of ventilation and heating of passenger cars was brought up and somewhat discussed. Mr. John Cogblan, Master Car-Builder of the Boston Revere Beach & Lynn road, will present at the October meeting drawings, etc., upon this important subject. This will probably be the topic for discussion for the next meeting.

Mr. Rob't. Hitchcock, Master Car-Builder of the Connecticut River road, explained the workings of the St. Louis automatic freight train brake which is in use upon that road to quite an extent.

Several new members were then added to the club. After some general business, in relation to plans for work during the coming winter had been attended to, and a statement given by the Treasurer, the meeting adjourned.

Master Car-Painters' Association.

The fourteenth annual convention of this Association was called to order Sept. 19, at eleven o'clock, at the Carrollton Hotel, Baltimore, with Vice-President Mr. John Rattenbury, Master Car-Painter of the Chicago, Rock Island & Pacific, in the chair, and Mr. R. McKee, of the New York, Pennsylvania & Ohio, Secretary. The Vice-President, in opening the meeting, expressed his thanks at again meeting so many of the brethren of the Association, and also the hope that their stay in Baltimore would be pleasant as well as profitable. The Secretary then called the roll, the following delegates to the convention answering to their names:

John H. Will, New York Central; C. L. May, Houston & Texas Central; C. T. Forristall, Terre Haute & Indianapolis; Joseph Murphy, Louisville & Nashville; George O. Widner, Lake Shore & Michigan Southern; George Forby, Missouri Pacific; A. P. Streeter, Detroit, Lansing & Toledo; William Davis, Canada Southern; N. Neher, North-Western; E. F. Josly, Lough Valley; E. L. Fetting, New York & New England; Alex. Campbell, New York Elevated; Wm. Lewis, Grand Trunk; A. J. Bishop, Cleveland, Columbus, Cincinnati & Indiana; James T. Cockburn, Pittsburgh, Cincinnati & St. Louis; James H. Stout, Baltimore & Ohio; E. L. Bigelow, Baltimore & Ohio; M. L. Simms, Richmond & Danville; J. H. Purdy, Baltimore & Ohio; John A. Butz, Pittsburgh, Cincinnati & St. Louis. The honorary members of the association who were present were: J. B. Cox, Salem, Mass.; J. Weymar, New York; W. L. E. Clark, Detroit, Mich.; P. F. Flood, Brooklyn, N. Y.; C. D. Estinger, Cleveland, O.; A. D. Keys, New York; John F. Weare, Chicago; J. A. Elmeendorf, Chicago; E. K. Numson, Frank Billings, Cleveland.

The entire session was taken up with the transaction of preliminary business, reading of reports of officers, and letters of regret from members unable to attend. The session in the afternoon began at 2:30 o'clock, and was opened with an election for officers. In the evening the members attended the performance at Ford's Grand Opera-House.

The annexed subjects were to come before the Association during the session: "Will the loss of earnings of a passenger car while in the shop for repainting be compensated for by the value of repairs done to it?" "What are the advantages, if any, of wood over muslin for car-head linings?" "The benefits of association as applied to master car-painters." "The value of the repeating process of varnishing in the light of another year's experience?" "Can a passenger car be painted in less time than thirty days to insure durability, and if so by what method?" "Is there any difference in the durability of a passenger car painted in the summer months and one painted in the winter?" "A few of the causes of unsatisfactory results in the paint shop?" "Testing of varnishes; suggestions of questions?" "What is the best material for painting on tin, galvanized iron or steel, to insure durability?"

ELECTIONS AND APPOINTMENTS.

Chesapeake & Ohio.—Mr. W. H. Thomas has been appointed Master Mechanic of the Western Division, in charge of the shops at Huntington, W. Va. He was recently on the Louisville & Nashville road.

Cincinnati & Eastern.—Mr. Samuel Woodward has been appointed Receiver. He has been General Manager of the road for some time.

Fitchburg.—At a recent meeting of the board of directors it was voted that Mr. John Adams, the General Superintendent, be requested to assume, as far as possible, the active duties of President, and that the President's clerk and all the officials of the company be subject to his orders and directions in the same manner as they have been subject to the late President. Mr. Adams has grown up on the Fitchburg Railroad, from the lowest grade of employment, and is thoroughly familiar with every detail of its business.

Franklin & Somerset.—This company was organized last week at New Portland, Me., with the following officers: Directors, D. M. Bonney, G. W. Clark, Horatio N. Clark, John P. Clark, Josiah Chase, A. Hutchins, J. B. Knowlton, A. J. Sweet, Zenas Vaughan; Clerk, E. R. Luce; Treasurer, John Metcalf.

Louisville & Nashville.—Mr. W. P. Pike has been appointed Master Mechanic in charge of the Henderson Division, in place of W. H. Thomas, who has gone to the Chesapeake & Ohio road. Mr. J. G. Clifford has been appointed Master Mechanic in charge of the shops at Bowling Green, Ky., to succeed Mr. Pike.

Mexican Central.—Mr. Charles C. Upham has been appointed Chief Engineer of the Tampico Line, with office in Tampico, Mexico. He has been for some time on the Northern Division, and was previously on the Atchison, Topeka & Santa Fé.

Nashville, Chattanooga & St. Louis.—The new board last week re-elected the old officers as follows: President, James D. Porter; General Manager, J. W. Thomas; Secretary and Treasurer, R. C. Bransford; Bookkeeper, J. D. Maney; Resident Engineer, R. C. Morris.

New York Central & Hudson River.—Mr. Henry M. Gould has been appointed Assistant Superintendent of the Western Division, with office in Rochester, N. Y. Mr. Gould has been Resident Engineer for several years.

New York, Texas & Mexican.—Mr. L. S. Daniel is appointed Train-Master and Station Agent at Victoria, Tex., to take effect Sept. 12, vice W. H. Munro, resigned. All communications pertaining to business within the province named should be addressed to him.

Western Railroad Association.—Mr. P. H. T. Mason has been appointed to succeed Mr. P. R. Marling as Chief Clerk in the office of the Western Railroad Association at Chicago.

PERSONAL.

—Mr. D. N. Pickering, for a number of years General Superintendent of the Central Iowa road, has resigned his position, on account of advancing age. He is now 70 years old and has been engaged in railroading for nearly 50 years.

—A Topeka dispatch says that Mr. C. C. Wheeler has resigned his position as General Manager of the Atchison, Topeka & Santa Fé road, to take effect Oct. 1. This step has been taken by Mr. Wheeler for reasons connected with his private business affairs.

—Mr. Alexander Campbell, for 30 years past a banker and broker in New York, died at Richfield Springs, N. Y., Sept. 15, aged 63 years. Before coming to New York, Mr. Campbell was for some years Secretary of the Philadelphia, Wilmington & Baltimore Company.

—Mr. D. B. Sibley, for several years Purchasing Agent of the Chicago, Burlington & Quincy, and previously General Storekeeper of the same road at Aurora, but for three or four years past engaged in business on his own account, died at his home in Chicago, Sept. 5.

—Mr. W. H. Thomas, Master Mechanic of the Henderson Division of the Louisville & Nashville road, having resigned in order to accept a position on the Chesapeake & Ohio, the men recently under his charge presented him with a handsome silver service and a valuable case of drawing instruments.

—Mr. L. B. Stillson, General Superintendent of the Nicaragua Railroad, died suddenly of congestion of the brain, at Corinto, Nicaragua, Aug. 9, aged 46 years. Before going to Central America Mr. Stillson was for a number of years connected with the Houston & Texas Railroad, as agent at Bridgeport and afterwards as Superintendent.

—Mr. Charles Blackwell has resigned his position as Superintendent of the Roanoke Machine Works, in order to devote his time to his duties as Superintendent of Motive Power of the Norfolk & Western and the Shenandoah Valley roads. Mr. Blackwell has planned the extensive works at Roanoke and superintended their construction.

—Mr. Franklin B. Gowen denies the rumors that he will shortly resign his position as President of the Philadelphia & Reading Co., to become General Solicitor of the South Pennsylvania. Mr. Gowen says that it has always been his intention to resign when the affairs of the Reading were again in good shape, but that he intends to resume the practice of the law, and will not accept a position with any company.

—Mr. Harry Fox, for many years a railroad contractor, died suddenly at Salt Lake, Utah, Sept. 4, aged 57 years. Mr. Fox began as a contractor on the Northern (New Hampshire) Railroad some 35 years ago, and had had contracts on the Grand Trunk, the Chicago & Northwestern, the Atchison, Topeka & Santa Fé and many other roads. For several years past he has been head of the firm of H. Fox & Co., bridge-builders and lumber-dealers, in Chicago.

—Mr. John C. Trautwine, the well-known engineer, died at his residence in Philadelphia, Sept. 18, after long suffering from a chronic stomach trouble. Mr. Trautwine was born in Philadelphia in 1810, and at an early age entered the office of Wm. Strickland to study civil engineering. His first work was as an assistant on the Delaware Breakwater. In 1844 he went to New Grenada as Engineer of the Canal del Dique, and five years later was made Chief Engineer of the Panama Railroad. After leaving that road he was engaged for several years in scientific surveys and explorations in South America and Central America. After his return to the United States he occupied himself chiefly in writing works on engineering subjects, and it is on his books that his reputation largely rests. His "Civil Engineer's Pocket Book" is, perhaps, more widely known and used than any other work of the kind, and he wrote also books on "Curves," on "Excavations and Embankments," and a number of others. Mr. Trautwine was a member of a number of engineering and scientific societies, in whose proceedings he took an active part. He leaves two sons, one of whom has been for some time his assistant in his literary work.

TRAFFIC AND EARNINGS.

Western Railway Weighing Association.

During the month of August the Western Railway Weighing Association weighed 63,480 cars of freight, an increase of 14,551 cars over July and 5,234 cars more than were weighed during the month of August, 1887. The total number of cars weighed during the year ending Aug. 31 was 575,159, an increase of 17,381 over the previous year.

A New Florida Line.

The Central Railroad of Georgia, the Brunswick and Western, and the Savannah, Florida & Western Railways have issued a joint circular announcing the opening on Sept. 16 of the line to Jacksonville, Fla., from all western points over the Central Railroad, the Brunswick & Western and Waycross Short Line via Atlanta, Macon, Albany and Waycross. This line will be operated with Pullman palace cars between Cincinnati and Jacksonville.

Boston Traffic Notes.

The Boston & Albany in the month of August received from the New York Central, at Albany, 10,302 freight cars, and delivered the same road 10,624. The number sent West from Boston the same month was 9,906 cars.

The freight traffic of the New York & New England across the Hudson at its Fishkill & Newburg transfer is expanding rapidly. In August the number of cars handled reached a total of 8,657, against 5,104 in August, 1887. The movement last month included 4,359 loaded cars bound east, of which 2,240 were loaded with coal. West bound there were 1,451 loaded and 2,804 empty cars. The freight movement via the Harlem River transfer in August amounted to a total of 7,602 cars in both directions, in comparison with 7,277 in August, 1887.

Railroad Earnings.

Earnings for various periods are reported as follows:

Eight months ending Aug. 31:	1888.	1887.	Inc. or Dec.	P. c.
Ches. & Ohio.....	\$2,514,181	\$2,097,360	I.	\$416,821 20.9
Eliz. Lex. & B.S.	451,366	305,401	I.	145,965 47.8
Fla. Cen. & West.	1,600,941	258,119	I.	2,522 1.0
Fla. Trans. & Pen.	313,677	263,330	I.	50,338 19.1
Hous. & W. Tex.	199,955	169,214	I.	30,741 18.2
Net earnings.....	122,512
Nash., Chatta. & St. L.....	1,514,115	1,357,705	I.	156,410 11.5
Net earnings.....	688,801	573,024	I.	115,777 20.2
N. Y. & N. Eng.	2,315,109	2,177,413	I.	137,696 6.3
Rich. & Danville lines:				
Char., C. & A.....	\$499,350	\$421,965	I.	\$77,445 18.3
Net earnings.....	206,441	151,123	I.	55,318 36.6
Col. & Green.....	451,006	415,328	I.	35,678 8.5
Net earnings.....	131,540	51,584	I.	79,956 154.8
Rich. & Danville	2,359,083	2,215,715	I.	138,968 6.3
Net earnings.....	979,200	639,821	I.	339,379 53.0
Va. Midland.....	1,051,894	914,949	I.	136,945 14.9
Net earnings.....	417,027	294,858	I.	122,069 41.4
Western N. C.....	221,873	146,441	I.	75,432 51.5
Net earnings.....	75,819	23,853	I.	51,967 217.4
Union Pacific.....	18,635,763	18,755,278	D.	122,512 0.7

Seven months ending July 31:

Bur. Cedar Rap. & No.....	\$1,476,845	\$1,489,676	D.	\$12,831 0.9
Net earnings.....	384,454	581,820	D.	197,366 20.2
Louisville & Nash.	7,514,683	7,184,644	I.	330,039 4.6
Net earnings.....	2,916,979	2,694,106	I.	222,873 8.3
Union Pacific.....	15,980,766	15,952,778	D.	4,502 0.0
Net earnings.....	7,471,641	6,993,063	I.	508,578 7.3

Month of July:

Bur. Cedar Rap. & No.....	\$195,989	\$198,276	D.	\$2,287 1.2
Net earnings.....	60,710	57,072	I.	3,638 5.2
Louisville & Nash.	1,130,300	1,063,765	I.	66,535 7.1
Net earnings.....	452,284	376,781	I.	75,503 20.0
Union Pacific.....	2,567,806	2,20,054	I.	367,752 16.4
Net earnings.....	1,225,920	985,005	I.	230,914 23.4

Month of August:

Ches. & Ohio.....	\$382,114	\$381,454	I.	\$660 0.2
Eliz. Lex. & B.S.	71,304	54,264	I.	17,040 31.5
Fla. Cen. & West.	32,194	31,133	I.	1,061 3.4
Fla. Trans. & Pen.	3,449	29,313	I.	5,1 0.7
Hous. & W. Tex.	30,324	25,543	I.	4,781 18.7
Nash., Chatta. & St. L.	216,638	169,787	I.	46,851 21.4
N. Y. & N. Eng.	377,223	346,490	I.	30,733 8.9
Rich. & Dan. lines:				
Char., C. & A.....	58,786	48,296	I.	10,490 21.8
Col. & Green.....	49,205	45,108	I.	4,097 8.3
Rich. & Dan.....	317,595	296,717	I.	20,878 7.0
Va. Midland.....	175,860	143,491	I.	32,369 22.6
Western N. C.....	44,957	39,744	I.	5,213 14.3
Union Pacific.....	2,632,600	2,770,000	D.	137,400 4.3

First week in September:

Ch. & Gd. Trunk.....	\$9,277	\$50,672	I.	10,605 20.8
Det. Lans. & No.	31,981	27,439	I.	4,542 13.7
Rich. & Danville lines:				
Char., C. & A.....	9,755	7,915	I.	1,840 23.3
Col. & Green.....	7,560	6,485	I.	1,075 16.5
Rich. & Dan.....	62,800	58,800	I.	4,000 6.8
Va. Midland.....	27,441	18,197	I.	9,244 59.8
Western N. C.....	5,740	2,808	I.	2,932 50.8
Rochester & Pitts.	19,438	7,527	I.	11,911 158.5
Tol., Cin. & St. L.	32,500

Second week in September:

Canadian Pacific.....	\$117,000	\$60,000	I.	57,000 95.0
Chi. & Alton.....	22,333	22,333	I.	4,318 1.9
Chi. & Eastern Ill.	36,403	58,200	D.	17,797 4.7
Chi. Mil. & St. P.	515,500	436,221	I.	79,279 18.0
Chi. & Northwestern.....	589,800	546,700	I.	43,100 7.8
Chi., St. P., & O.	120,040	113,000	I.	7,040 6.0
Denver & R. G.....	162,200	145,800	I.	16,400 11.3
Long Island.....	72,965	72,822	D.	143 0.2
Louisville & Nash.	290,900	250,895	I.	40,005 13.5
Mil. L. S. & W.....	20,985	20,455	I.	530 2.6
Mo. Pacific lines.....	1,263,247	1,093,948	I.	169,299 15.5
Northern Pacific.....	228,650	178,000	I.	50,650 28.5
St. L. & San Fran.	84,400	80,600	I.	3,800 4.7

Richmond & Danville weekly earnings are freight earnings only, passenger earnings being included only in the monthly statements.

From Portland to Portland.

On Sept. 17 a train of 10 cars loaded with canned corn started from Portland, Me., to run through to Portland, Oreg., without breaking bulk. A return train will probably be sent loaded with canned salmon.

Coal.

Coal tonnages for the week ending Sept. 8 are reported as follows:

	1888.	1887.	Inc. or Dec.	P. c.
Anthracite.....	717,329	408,794	I.	308,535 75.5
Semi-bituminous.....	124,375	106,471	I.	18,104 17.0
Bituminous, Penna.....	69,372	64,344	I.	5,028 6.5
Coke, Penna.....	58,428	51,745	I.	6,683 12.9

Cumberland shipments are now very large, and indicate close competition with the Clearfield Region, the shipments from which are also very heavy. Both bituminous and coke shipments show an increase.

The coal tonnage of the Pennsylvania Railroad for the week ending Sept. 8 was as follows:

	Coal.	Coke.	Total.
From line of road.....	131,065	46,066	177,131
From other lines.....	55,379	12,332	67,711
Total.....	186,444	58,428	244,902

The total tonnage this year to Sept. 8 was 1,855,008 tons as compared with 7,527,000 tons to the corresponding date in 1887, showing an increase this year of 628,008 tons or 8.3 per cent.

The coal tonnage of the Chesapeake & Ohio road for the eight months to Aug. 31 was as follows:

	1888.	1887.	Inc. or Dec.	P. c.
Coal.....	607,461	557,374	I.	49,887 8.9
Coke.....	70,961	60,026	I.	10,935 18.2
Total.....	678,422	617,400	I.	60,922 9.8

The coal tonnage this year was divided as follows: Canal, 19,704; split and block, 67,567; gas coal, 249,534; New River, 270,226; total 607,031 tons.

Cumberland coal shipments for the week ending Sept. 15 were 61,420 tons. The total shipments this year to Sept. 15 were 1,733,035 tons.

The statement of anthracite coal tonnages for August and the eight months, ending August 31, as prepared by Mr. John H. Jones, the Official Accountant, is as follows: This

statement including the entire production of anthracite coal, excepting that consumed by employees, and for steam and heating purposes about the mines:

	August	Eight Months— 1883	1882
Philad'a & Read...	1,311,954	694,410	5,989,089
Cent of N. J.	412,370	1,745,399	2,716,815
Lehigh Valley....	615,612	576,511	3,902,082
D. & L. & W.	557,487	482,936	3,202,202
D. L. & H. Canal			2,943,319
Co.	3,128	596,583	2,171,705
Pennsylvania R. R.	266,933	243,940	1,716,111
Penn'a. coal Co.	167,985	160,979	942,465
N. Y., L. E. & W.	38,159	26,983	221,512
Total.	3,324,711	2,894,702	19,951,165

New Jersey Central tonnage is included in that of the Philadelphia & Reading road from June 1, 1883. The Lehigh Valley tonnage includes that of the State Line & Sullivan road, which was 5,883 tons in August of this year. In addition to the tonnage credited to the Delaware & Hudson Canal Co., there were 66,663 tons transported from mines by that company in August, 1883, which is included in tonnage of other interests.

The total increase in August was 430,009 tons, or 14.9 per cent. For the eight months the increase was 1,731,362 tons, or 9.5 per cent. Taking the Reading and New Jersey Central tonnages together, as must be done to make a fair comparison, all the companies show gains, both for the month and the year.

The distribution of tonnage for the eight months was as follows: Philadelphia & Reading (including New Jersey Central), 38.8 per cent.; Lehigh Valley, 19.9; Delaware, Lackawanna & Western, 16.0; Delaware & Hudson Canal Co., 10.9; Pennsylvania Railroad Co., 8.6; Pennsylvania Coal Co., 4.7; New York, Lake Erie & Western, 1.1 per cent. of total.

The stock of anthracite coal on hand at tidewater shipping points Aug. 31 was 576,132 tons; on July 31 it was 502,159 tons, showing an increase of 73,973 tons, or 14.7 per cent., during the month.

Crop Prospects.

A canvass of the reports of the damage by frost and the condition of corn in Iowa shows much more extended damage than was at first reported. The western half of the state has not escaped, and in some counties below the middle of the state much damage has been done. On the other hand, the damage does not seem to have been general, even in the northern third of the state, or, rather, it has not been very great in them all. For instance, in Floyd County, on the Iowa & Dakota Division of the Milwaukee & St. Paul about 70 miles west of the Mississippi, a correspondent writes that he thinks there will be no marketable corn, while in Chickasaw County, adjoining it on the east, the damage by frost is reported not to have been great. A good deal of injury by frost in two or three counties south of Des Moines, and in some of the northwestern counties. But it is also noticeable that there were few counties where the corn was in satisfactory condition before the frosts. A very large amount of Kansas and Nebraska corn was planted and this is all very late, and the ripening of it seems not to be expected.

There was also considerable damage to corn, at least on low lands, in Southeastern Dakota.

In Northern Illinois it seems that the corn on low ground was killed, but that that on high ground escaped. The damage thus varies with the proportion of low ground. The reports all agree, we believe, that the fields planted with Nebraska seed, of which there is a great deal, will not be out of the way of frost for some time after Oct. 1. Thus the yield is still very uncertain in Iowa, in Illinois north, say, of the latitude of Peoria, and in Northern Indiana, where, by the way, great damage was done by frost to what corn there is there, where a very large proportion of the ground is low. In Kansas and in Nebraska south of the Platte (where perhaps seven-eighths of the Nebraska corn is grown), the corn is out of the way of the frost except a little in Nebraska, and this is true of most of the corn south of Iowa and the latitude of Peoria in Illinois and further south, with exceptions, however, much for her south.

The advance in the price of corn at Chicago since the frost has been but a few cents a bushel, and this is a pretty trustworthy indication that the damage cannot have been great. The traders have so much at stake that they take great pains to learn the facts, and on the whole they are not likely to be greatly misled.

Grain Movement.

For the week ending Sept. 8 receipts and shipments of grain of all kinds at the eight reporting Northwestern markets and receipts at the seven Atlantic ports have been, in bushels, for the past eight years:

Year.	Northwestern receipts.	Total.	By rail.	P. c.	Atlantic receipts.
1876	3,512,610	4,657,952	1,098,318	23.3	3,607,278
1877	5,751,856	4,931,113	1,024,304	20.9	4,907,774
1878	6,397,200	5,813,414	1,122,581	17.8	8,249,026
1879	6,837,719	5,529,939	1,358,969	24.2	7,305,081
1880	5,531,085	5,135,991	1,354,435	26.2	7,401,178
1881	7,129,934	5,974,490	2,436,314	40.8	5,492,727
1882	5,876,002	5,276,710	2,197,530	41.7	4,923,294
1883	9,805,091	7,538,579	2,440,717	32.4	6,149,483

The receipts of the Northwestern markets are not only much larger than those of the corresponding week of any preceding week, but they were never equaled in any week before.

The shipments of these markets were also larger than in the corresponding week of any previous year, and were 2,262,000 bu-bls (43 per cent.) more than last year. They have been equalled only three times, two of which were weeks at the opening of navigation, when the whole fleet that has wintered at the shipping ports sails at once. The rail shipments, however, were not quite so large as the week before. The shipments down the Mississippi amounted to 278,344 bushels, or 2.7 per cent. of the whole, which is the largest amount for five weeks.

The Atlantic receipts, though a fourth more than last year and a ninth more than in 1881, were much less than in 1878, 1879 or 1880. They were, however, 1,118,000 bushels more than in the previous week of this year, and were the largest since the last week of August, 1882, and with that exception were the largest since July, 1881.

The great increase in Northwestern receipts is this week due chiefly to wheat, the receipts of which were larger than in any previous week of this year or in the corresponding week of at least three weeks previous. They were not nearly so far below the corn receipts as they have been heretofore this season. There was very little increase over the previous week in corn, and none in oats. Corn formed 38 per cent., wheat 32 per cent., and oats 24 per cent. of the total receipts. The whole increase over the previous week, and more, was at Chicago, whose receipts were the largest on record.

The increase in Atlantic receipts was more in corn than wheat, and it was wholly at New York, Boston and Montreal. Baltimore's receipts were much less than its average in August; Montreal's were the largest since August, 1880, with the exception of the first week of August last year; New York's the largest since July, 1881.

The exports of Atlantic ports for the week ending Sept. 8 have been, for four years:

	1879	1880	1882	1883.
Flour, bbls	142,024	136,618	198,792	114,249
Grain, bush	5,155,736	2,954,567	2,874,804	2,667,647

Total, bush 5,794,814 3,569,348 3,768,368 2,781,896

Thus the exports this year were 987,000 bu-bls less than last year, 788,000 less than in 1881, and 3,013,000 less than in 1880.

San Francisco exports for the two months of the California crop year from July 1 to Sept. 1 were as follows, flour in barrels and wheat in bushels, flour being reduced to wheat in the totals:

	1883.	1882.	Inc. or Dec.	P. c.
Flour	175,960	175,372	588	0.3
Wheat	2,865,702	4,139,665	D. 1,273,963	30.4

Total, bushels 3,745,502 5,016,525 D. 1,271,023 25.3

Exports of California barley by sea for the two months were 48,468 cwt. No rail shipments are reported for the two months.

RAILROAD LAW.

Railroad Taxation in California.

A San Francisco dispatch of Sept. 17 says that on that date the Court rendered a decision in the suits brought by the Central Pacific Co. against several counties in the state. The decision is that, under the constitution of the state, the amount for which railroad property is mortgaged must be deducted from its value in order to find the legal valuation of the property, on which the taxation must be based. The property of the company had been assessed in most of the counties at its full value, and this decision will make a large reduction necessary.

OLD AND NEW ROADS.

Anniston & Atlantic.—This company has put regular trains upon the section of its road from Alabama Furnace to Clifton Mines. This section of 10 miles was built some time ago for the purpose of carrying ore to the furnace, but was recently secured by this company and will be made part of the main line of its road.

Boston & Lowell.—The Boston Advertiser of Sept. 18 says: "Mention has already been made of a possible lease of the Boston & Lowell to the Grand Trunk Railway, of Canada, and the matter has received considerable attention during the past few days. A special meeting of the Boston & Lowell directors was announced for yesterday, presumably to act on the matter, but though the proceedings were not made public, it may be authoritatively stated that no lease has been made, and that there are some very grave obstacles to its consummation. It is easy to understand why the Grand Trunk people should be desirous of securing the Boston & Lowell. In the first place, its terminal facilities, costing some \$5,000,000, are the best Boston terminals available for the Grand Trunk, and the Boston & Lowell is the natural outlet for the through line from Montreal, composed of the Grand Trunk, Central Vermont, Northern and Concord roads. Of course during the occasional and temporary disagreements between the component roads of the line, there has been some talk of the upper roads seeking a Boston outlet via the Fitchburg or the Boston & Maine, but a glance at the map will show that while such a connection is possible, it is not the natural way, and would be adopted only under strained circumstances. Besides, the Boston & Lowell and Central Vermont interests control the charter—extended for several years by the late New Hampshire legislature—for the projected Forest Line Railroad, from Windsor, Vt., to Greenfield, N. H., to connect the Central Vermont at the former point with the Wilton Division of the Nashua & Lowell—leased for 99 years to the Boston & Lowell—at the latter point. This proposed road, the surveys of which show that it can be speedily and cheaply built, in nearly an air line, would give a through route from Boston to Montreal, some 30 miles shorter than the present line via the Concord and Northern railroads, and would leave the latter roads out in the cold, so to speak, and make the Boston & Lowell, Central Vermont and Grand Trunk the only roads on the main line between Boston and Montreal. With the Boston & Lowell controlled by the Grand Trunk, the building of this link, which could be done at any time during the next few years, independent of the new Colby general railroad law, would give the Grand Trunk and Central Vermont, whose relations are now very intimate, a complete, independent line between the two cities. Besides, the threat of building this link could be constantly held over the heads of the Concord and Northern, should they refuse to make satisfactory arrangements for through business. In the second place, the Boston & Lowell would be quite ready to lease itself to a connecting line on satisfactory terms, as its expensive terminals are only fed by about 40 miles of its own line, making its pro-rata of the long haul on through traffic very small.

But, as has been said, there are very serious obstacles to a lease to the Grand Trunk Railway Co. That is a foreign corporation, controlled in London, and its property in this country is covered with mortgages, three or four deep. Should its managers at any time within a few years after consummating a lease decide that they do not care about a Boston terminus, as they now appear to be indifferent to their Portland terminus, it would be possible, by means well known to railroad men, for them to 'skin' a million or two out of the Boston & Lowell, which has always, and especially of late years, more, perhaps, than any other Boston road, except the Boston & Albany, kept its road-bed, stations and equipment in splendid condition, and expended much money annually in repairs and improvements. As an instance, it has recently built a new station at Arlington—the fare to which point is only 9 cents from Boston—at a cost of \$25,000, and it is the purpose of the management to renew its suburban stations in a similarly substantial and costly manner. Besides, since the termination last spring of the running arrangement with the Concord Railroad, the Boston & Lowell, under the capable and intelligent management of Superintendent Charles S. McLean, has been earning net at the rate of 7 per cent. per annum, after paying all fixed charges, and the stockholders would naturally be averse to any lease that should not guarantee them at least as large returns for their investment. Still further, it is urged that as many of the largest owners in the Boston & Lowell stock and several of the directors are heavily interested in manufacturing enterprises at Billerica, Lowell, Nashua, Manchester, Concord and other points, which industries are very satisfactorily served by the Boston & Lowell management, they would think twice before handing over their transportation to a foreign corporation, which would certainly not have the same interest in handling local traffic in their interest that the Boston & Lowell has. The latter road is undoubtedly the key to the through line between this city and Montreal, and it is safe to say that no lease will be made except at a very handsome rental,

and under the most ample guarantees for the satisfactory operation of the line by the lessee corporation."

Boston & Providence.—The Boston Advertiser of Sept. 17 says: "A nice job was accomplished at the crossing of the Boston & Providence and Boston & Albany railroads yesterday, when the cross-ties underneath the crossing-frogs were taken out and replaced by heavy iron girders, of Edgemoor plate and angle iron, riveted solidly together, and to which, in turn, the frogs were bolted. The operation attracted a crowd of spectators to the Dartmouth Street Bridge. It was quite amusing to see the heater at the portable forge throw a white-hot rivet a couple of rods to the riveters, one of whom would catch it in a nail-keg, while another would seize it with tongs, insert it in the hole, and with another man's help would rivet it in place. The job was completed with no delay to trains, a Boston & Providence switching-engine and wrecking-car handling the material and doing all the heavy lifting."

Buffalo, New York & Philadelphia.—Work is progressing on the terminal improvements and the enlargement of the yards of this road in Buffalo.

Track is now all laid on the branch from Olean, N. Y., to Salamanca, and freight trains have begun to run over it. This branch is 18½ miles, and extends the River Division from Salamanca eastward to a connection with the Buffalo Division at Olean. Its completion will send to the Buffalo Division a considerable coal traffic from the River Division which has heretofore reached Buffalo over the Southwestern Branch of the Erie.

Central, of Georgia.—The Savannah (Ga.) News says: "It is difficult to understand how the rumor that Jay Gould had obtained a controlling interest in the Georgia Central Railway got abroad. There was certainly no foundation for it. There have been rumors for some time that Mr. Gould had secured control of the Louisville & Nashville Railway, but these rumors excited no surprise. The stock of that road is held in large blocks by parties who are speculators, and who are always ready to make a good bargain. The rumor that the control of the Central had passed into the hands of Mr. Gould did, however, excite a great deal of surprise. In the first place, there is very little, if any, of the stock of the road on the market. In the second place, the stock is divided among a very large number of holders. Attempts have been made within the last few days to purchase a few shares, at the market price, without success. Without knowing exactly how the stock is distributed, enough is known to justify the statement that, in order to get a controlling interest, the shares of a large number of stockholders would have to be secured. It is apparent, therefore, that no extensive purchase of the stock could be made without exciting suspicion and affecting the market. It will be remembered that two years ago an effort was made to secure a majority of the stock, and the price went to \$160 per share. Even at that price only about 15,000 shares were obtained. There is no reason why there should be a sale of the road. It is in a very prosperous condition. The interest on its bonds is always promptly paid, and a good dividend on the stock is earned. It will be seen from this statement that it is about impossible for Mr. Gould or any other capitalist or combination of capitalists to get the road out of the hands of its present management. It is true that Mr. Gould might lease the road, and in that way, get control of it, but it is hardly probable that he would be willing to pay the rental that would be demanded. The present management have no reason for wanting to lease it and they would hardly yield possession of a property that pays so handsomely, unless the inducements, from a business point of view, were so great that it would be for their interest and the interest of those they represent to do so. It is not reasonable to suppose that any such inducements have been or will be offered. Mr. Gould does not buy prosperous roads. He buys, as a rule, roads that are financially embarrassed, and which can be had cheaply. He depends upon his ability to make them pay. If Mr. Gould wants to extend his Southwestern system so as to reach Savannah, there are roads he can get that will assist him in carrying out his purposes for much less money than he would have to pay for the Central."

Chicago, Burlington & Quincy.—Work has been begun on the extension of the Nebraska line from Beatrice, Neb., westward. The track of the Wymore Branch will be used from Beatrice to Dewitt, 13 miles; from Dewitt the line will run west to Belvidere and thence southwest to the Republican Valley line near Chester, about 55 miles from Dewitt. The line will be built under the Nebraska & Colorado charter.

The freight traffic of Sept. 1 and 2, the Aurora, Ill., Beacon says, was perhaps the heaviest done on the road for two years. In the 48 hours ending at 6 p. m. on the 2d, 189 trains were registered at the Aurora yards, with a total of about 9,000 cars.

Chicago Central Elevated.—This company has filed articles of incorporation to build an elevated railroad from some point in Chicago to the village of Riverdale, with branches to South Chicago, Englewood and Washington Heights, and to the towns of Proviso and Norwood Park. The capital stock is \$6,000,000.

Chicago, Milwaukee & St. Paul.—The extension of the Hastings & Dakota Division from Aberdeen, Dak., westward, has been located for 56 miles, and grading is progressing rapidly. The extension will not be surveyed any further this season.

Nothing has been definitely decided, or at least announced, as to the proposed extension from Mitchell, Dak., to the Northern Pacific at Bismarck. The distance from Mitchell to Bismarck is 242 miles, and on the northern end of the line some heavy work would be needed.

Chicago & West Michigan.—It is reported that this company is negotiating for the purchase of the Michigan & Ohio road, which would extend its lines to Toledo, when that road is completed.

Cincinnati & Eastern.—At Batavia, O., Sept. 14, the Clermont County Court appointed Mr. Samuel Woodward, General Manager of the road, Receiver, on application of Stephen Feike, a creditor for work done on the line. Counsel for the company was present, and consented to the appointment. The road is nearly finished from Cincinnati to Portsmouth, and was soon to be changed from 3 ft. to standard gauge. It is stated that the receivership was asked for to protect the creditors, and that the intention is to continue it only until the road can be completed to Portsmouth and the gauge changed.

Columbus & Eastern.—This company has filed for record a mortgage to secure a proposed issue of \$5,000,000 bonds. Some grading has been done on the road near Columbus, O., but no part of the road is finished.

Consolidated Railroad Co. of Vermont.—It appears from later advices that the United States Circuit Court refused to grant the injunction asked for by Roland G. Hazard to restrain this company from issuing its bonds in exchange for Vermont & Canada stock, as provided for in the agreement of reorganization. This decision (which is

given in full elsewhere) is based chiefly on the decisions of the Vermont courts, and on the opinion of the Court that Mr. Hazard was not in danger of suffering any wrong in equity should the issue of the bonds proceed.

Danville & New River.—The directors have resolved to issue \$250,000 bonds secured by mortgage on the Middle Division of the road from Martinsville, Va., to Patrick Court House, 32 miles. Of these bonds \$60,000 will be exchanged for the second-mortgage bonds issued on the First Division, from Danville to Martinsville. That division of the road, 48 miles in length, is now in operation, and work is progressing on the Middle Division.

Dover & Barrington.—This company has been organized to build a railroad from Dover, N. H., to a connection with the Nashua & Rochester at Barrington or Lee. The distance is about 7 miles.

Dublin Branch.—This company has been organized to build a railroad from Alice, Ga., to the East Tennessee, Virginia & Georgia road, northeast to Dublin on the Oconee River in Laurens county, a distance of about 25 miles.

East Tennessee, Virginia & Georgia.—The Atlanta (Ga.) Constitution says: "One who has not visited the East Tennessee shops would be surprised to see the vast changes that have been wrought in that section of the city since the donation of the ground to the East Tennessee, Virginia & Georgia Railroad Co. One year ago that portion of the town was void of all improvement. To-day it is a thriving, busy town within itself, and by the inhabitants it is called Pittsburgh. The railroad company has spent over \$100,000 in building, and still the work of adding goes on. The main machine shop has just been completed, and the most improved and valuable machinery is being planted in the building. It is a handsome brick structure 72 by 250 ft., and cost \$25,000. The openings are large, and the ventilation is good. The machinery in this building cost the company \$50,000, and its 100 men are constantly engaged, at a cost of \$2.50 per day each. Southeast of this shop, the round-house is being built at a cost of \$50,000. This will be one of the handsomest and best constructed round-houses in the South. It will have 32 stalls and a diameter of 266 ft. It will be completed in the most approved style. The boiler house now contains two boilers and two more will be placed in the building. It is also of brick and is 32 by 52. The building cost \$3,000 and the boilers are worth \$1,000 each. The blacksmith shop is constructed of wood but it required \$5,000 to put it up. It now has 30 forges and its capacity is 40 forges. The steam hammer is an immense affair and is known by mechanics as an 800-pound hammer. In this shop about 50 men will find employment. The foundation for the storehouse is now being laid. The building will be of brick and is 80 by 40 ft. The building will cost about \$35,000, and will contain about \$15,000 in stock at all times. In this building Mr. M. J. Rodgers, the Master Mechanic, will have his office. The repair shop and wood-work department, in which cars will be repaired and built, will soon be begun. It will have a diameter of 300 ft., and will cost about \$10,000, and in it nearly 100 men will find employment."

Franklin & Somerset.—This company has been organized to build a railroad from South Strong, Me., on the Sandy River road, northward to New Portland, about 15 miles. The town of New Portland has voted a 5 per cent. tax in aid of the road.

Georgia Pacific.—At a special meeting of the stockholders in Birmingham, Ala., Sept. 11, resolutions were passed authorizing the issue of additional bonds to the amount of \$15,000 per mile, to be secured by a second mortgage on the road.

Track is now laid continuously from Atlanta, Ga., westward to Cane Creek Tunnel, Ala., 139 miles. From Birmingham, Ala., the track is laid eastward to the McComb trestle, 13 miles. There remains a gap of 16 miles, the completion of which depends chiefly upon the work at the tunnel. It is expected that trains will run between Atlanta and Birmingham, 168 miles, in November.

Grand Trunk.—A cable dispatch from London to the Toronto Globe says: "The Grand Trunk Railway Co. announces that the accounts just passed for the half year show a balance, after paying preferences, sufficient to pay the Grand Trunk first and second preferences, the Great Western preference in full: also three shillings and three pence per share on Great Western ordinary stock. It is proposed to recommend the proprietors to keep Great Western ordinary full interest, and adjust the accounts next December."

Illinois Central.—This company's statement for August gives the earnings from traffic in that month as follows:

	1883.	1882.	Inc. or Dec.	P. c.
In Illinois.....	\$615,185	\$686,844	D. \$41,659	6.0
In Iowa.....	152,705	180,532	D. 7,827	4.8
Southern Div.....	281,851	236,862	I. 44,989	19.0
Total.....	\$1,079,721	\$1,084,238	D. \$4,517	0.4

The Land Department reports for August, 1883, sales of 2,290.11 acres of land for \$11,549.04. Cash collections on land account were \$10,665.59 for the month.

Louisville, New Orleans & Texas.—The track from Memphis, Tenn., is now laid southward 14 miles to Dogwood Ridge, and work is progressing steadily. The contractors have promised to have the rails laid to Clarksdale, Miss., 60 miles from Memphis, by the end of November.

Maine Central.—The proposition made by this company for a consolidation of the Boston & Maine, the Eastern and the Maine Central has, it is stated, resulted in an offer from the Boston & Maine to lease the road. The terms of the offer have not been made public.

A dispatch from Waterville, Me., Sept. 18, says: "A committee of Maine Central directors, consisting of W. G. Davis, W. H. Baxter, Darius Alden, F. A. Wilson, F. W. Hill, Abner Colburn and E. F. Webb, met here to-day to consider a proposition to lease their road to the Boston & Maine. A communication to President Lord, of the Boston & Maine, was drawn up and signed by all present, the contents of which it was not deemed proper to give to the public at this date. It is evident that no decisive action has been taken, and that many future meetings and consultations will follow before a basis of settlement is reached."

Marietta & North Georgia.—Recently some of the old stockholders, who were opposed to the transfer of the stock to the Boston party represented by George R. Eager, presented a memorial to the Legislature of Georgia, asking that the grant of convict labor to the road be revoked. The Legislature appointed a special committee to investigate the matter, and that committee has now made a report to the effect that the agreement under which the stock was transferred to Eager was a proper and equitable one, and that he has so far fully complied with its conditions; that the completion of the road is of importance to the section of the state through which it passes, and that the grant of convict labor should be continued.

Massachusetts Central.—About 220 of the 3,500 first-mortgage bonds have not yet been assented to the plan

of reorganization, and of these it is said that 70 will come in in a short time. Those bondholders who do not join in the reorganization will receive from the proceeds of the foreclosure sale about 12½ per cent. of the par value of their bonds. The bondholders' committee is now arranging for money to complete the purchase of the road and pay off the prior claims. No action has yet been taken toward operating the completed road.

Mexican Central.—Chief Engineer Lewis Kingman reports that on the Chihuahua Division during the month of August there were 66.49 miles of track laid and surfaced on the main line, besides 1.89 miles of side track, together making 68.38 miles of track, the best month's work yet done in Mexico. The track has reached Villa Lerdo, which is 515.8 miles south of El Paso, Texas.

Mexican Railroad Notes.—The following notes are from the Mexican Financier of Aug. 25:

The San Martín Texmelucan Railway carried 10,105 passengers in June, and the receipts were \$3,008.55.

The Puebla & San Marcos Railway carried 10,278 passengers in June, and the total receipts of the company for the month were \$6,068.

The Querétaro tramway is nearly finished out to Hercules factory, where it will supply a population of something like 7,000 with cheap transportation to and from the city.

At last accounts the English steamer "Statesman" was expected at Brazos de Santiago with 500 tons of rails, fishplates and other material for the Matamoros & Monterey line of the Mexican National.

The construction of the railway from Santiago Tuxtla to Palo Herrado will soon begin. When it is finished passengers will be enabled to connect with two steamers plying on the Tuxtlas between San Juan and Tuxtepec.

On the Mexican National Railway between Acámbaro and Celaya 2,000 men were employed in the work of construction in July. On the section of the road beyond the crossing of the Mexican Central, between Celaya and Dolores Hidalgo, 3,000 men were employed. The section comprises 32 kilometres.

The number of passengers carried on the Puebla & Izucar Matamoros Railway between Puebla, Cholula, Santa María Acuxcomac and San Augustin in the year ending July 30, 1888, was 151,342, an average of 12,612 a month, and 414 to 416 a day. Only animal power is yet used on the road.

According to the Chihuahua News there is good authority for the statement to the effect that inside of 120 days there will be a railway from Piedras Negras to Parral. The "good authority" must be in error this time, for there appear to be no signs of such a railway. The opening of the Mexican Central to Huejuquilla gives Parral daily communication and mails to Chihuahua and the States.

The third city tramway in the state of Chihuahua will be in Huejuquilla, connecting the centre of the town with the Mexican Central station. The other two tramways in the state are the one now running between El Paso and Paso del Norte, crossing the Rio Grande, and the one building in the state capital, for which the International Lumber Co. of that city is building three cars.

The Matamoros & Monterey line of the Mexican National is now graded for some distance beyond Reynosa, and at last accounts 39 kilometres, or about 24 miles, of track had been laid from Matamoros. It is said at Monterey that on the completion of the line from Monterey to Saltillo, which would be at about the end of this month, the company would concentrate all its forces on the Matamoros line, beginning work also at the Monterey end.

On the northern division of the Mexican Central in July they were making the survey of the line as far south as San Juan de Guadalupe, in the state of Zacatecas, about half-way between Paso del Norte and Mexico. The number of passengers carried in July on the section between Paso del Norte and Chihuahua was 2,359, and the receipts for the month were \$24,021. Advice received at the office in this city since the opening of the road to Huejuquilla say that the number of passengers carried is much larger than on the section north of Chihuahua, there being a far greater tributary population. Work on the Tampico Division had been much interrupted by the heavy rains. Track-laying had reached Las Palmas, or kilometer 115.

The inspector of the Pacific line of the Mexican Central reports that for the months of June and July the grading was finished between the wharf at San Blas and Station 2,140, making a total length of 21,400 kilometres. Work has been much delayed by the breaking out of intermittent fever among the laborers, causing a great number of them to leave. The number of men employed during June varied from 544 to 1,128, and the wages paid amounted to \$18,011. The material received during the same month consisted of 31,523 redwood sleepers from California. The work on the surveys and location was suspended at about the middle of last month. The three engineers in charge of the same were ordered to Tepic, where they were notified that a reduction of 20 per cent. in the salaries of all the employees in the engineering department had been ordered. The result was the resignation of the chiefs and the consequent suspension of the other employees. At the date of the suspension of the surveys Mr. Laub had finished the location of the first section of 100 kilometres, and Messrs. Kirchoff and Perry were surveying the line through the cañon of the Rio Ameca. A small party was left studying the current of the Ameca and the maximum height of the waters in times of flood.

Michigan & Ohio.—It is said that negotiations are in progress for the sale of this road to the Chicago & West Michigan Co. The road, which is now about half completed, is to extend from Toledo, O., to Allegan, Mich., about 150 miles. This purchase, if completed, would give the Chicago & West Michigan a terminus at Toledo and a connection with the coal roads which reach the lake at that point.

Nashville, Chattanooga & St. Louis.—This company makes the following statement for August and the two months of its fiscal year from July 1 to Aug. 31:

	August.	1882.	Two months.	1882.
Earnings.....	\$216,658	\$189,788	\$412,126	\$376,281
Expenses.....	105,61	112,186	204,076	215,796
Net earnings.....	\$111,497	\$77,600	\$208,050	\$160,485
Interest and taxes.....			110,571	108,015
Surplus.....			\$97,479	\$52,470

For the two months there was an increase of \$35,845, or 9.5 per cent., in gross earnings; a decrease of \$11,720, or 5.4 per cent., in expenses; an increase of \$47,565, or 29.6 per cent., in net earnings; an increase of \$2,556, or 2.4 per cent., in interest and taxes, and an increase of \$45,009, or 85.7 per cent., in surplus.

At the annual meeting last week it was voted to authorize the building of an extension of the Sparta Branch from Sparta, Tenn., to the Bon Air coal fields, a distance of 6½ miles.

New Hampshire General Railroad Law.—The Governor of New Hampshire has approved the general railroad law known as the Colby bill, and it is now a law. It provides, as has been already stated, for the consolidation of railroads and their lease without the special acts heretofore necessary, but it is not favorable to the building of new roads.

The railroad commission bill, providing for a new commission with powers very similar to those of the Massachusetts Commission, which was passed by the Legislature last week, was vetoed by the Governor, his objections being based chiefly upon the method of appointment by the commissioners, who were to be elected by the Legislature. A new bill was at once prepared, containing the same provisions, but giving the power of appointment of the commissioners to the Governor and Council. This bill was hurried through the Legislature a day before its final adjournment, and was at once approved by the Governor.

New York, Susquehanna & Western.—It is reported that this company is having a preliminary survey made for an extension of its line from Stroudsburg, Pa., up the Delaware Valley to Fort Jervis.

New York, West Shore & Buffalo.—Regular trains will run to Syracuse, Oct. 1, when the main line from Coeyman's Junction to Syracuse will be formally opened for business.

At the Weehawken terminus the company has already completed two freight houses, each 200 by 800 ft. and two stories high. The passenger station and ferry slips are nearly completed. The company here has 275 acres of land, with a water front of 6,790 ft.

Work is progressing actively on the shops at East Buffalo. The buildings include a round-house with 20 stalls; machine shop 216 by 85 ft.; blacksmith shop 115 by 74 ft.; wood machine shop 300 by 74 ft., and a freight car repair shop. The buildings are all of brick, with iron roofs. A second round-house, a passenger car shop and a paint shop will soon be begun.

The track from Buffalo east is now laid to Akron, 20½ miles, except a short gap at the Tonawanda Branch crossing. Track laying is progressing from Akron eastward and at several other points.

North Pacific Coast.—It is reported that this road has been sold to the Oregon & Transcontinental Co., the supposed intention of that company being to extend it northward along the coast with the ultimate intention of connecting with its Oregon & California line. To do this would require the building of some 200 miles of new road through a rough and hilly country now entirely without railroads. The road, which is owned by the Russian River Lumber Co., now runs from Sausalito, on the north side of San Francisco Bay, to Duncan Mills on Russian River, a distance of 80 miles.

Ohio Central.—It is stated that the car-trust trustees have taken possession of their property, and arranged to take wheelage on their cars instead of regular payments, until an arrangement can be made with the River Division bondholders.

Oregon Improvement Co.—This company makes the following statement for July and the eight months of the fiscal year from Dec. 1 to July 31:

	July.	Eight months.
Earnings.....	\$403,796	\$2,518,013
Expenses.....	232,140	1,740,106
Net earnings.....	\$151,656	\$777,907

For July the gross earnings show an increase of \$135,664, or 50.6 per cent.

Oregon Railway & Navigation Co.—This company makes the following statement for August and the two months of its fiscal year from July 1 to Aug. 31:

	August.	1882.	Two months.	1882.
Earnings.....	\$496,950	\$490,800	\$958,300	\$923,127
Expenses.....	226,000	227,500	455,500	429,479
Net earnings.....	\$270,950	\$263,300	\$502,800	\$493,648

For the two months there was an increase of \$35,173, or 3.8 per cent., in gross earnings; an increase of \$26,021, or 6.1 per cent., in expenses, and an increase of \$9,152, or 1.9 per cent., in net earnings.

Pacific Coast.—It is stated that as soon as the extension of this road from Los Alamos, Cal., to Santa Barbara is completed, or possibly sooner, work will be begun on an extension from San Luis Obispo north by west to a connection with the South Pacific Coast road near Santa Cruz. The distance from San Luis Obispo to Santa Cruz is about 150 miles, and a considerable part of the line would be parallel to the Southern Pacific. The extension would complete a line parallel with the coast from San Francisco to Santa Barbara, over 250 miles.

Pennsylvania.—Track on the new Ridgway & Clearfield Branch is now laid from the junction with the Philadelphia & Erie Division at Ridgway, Pa., southward to Brockwayville, 22 miles, leaving 5 miles to be laid to complete the connection with the Low Grade Division of the Allegheny Central at Falls Creek.

Philadelphia & Reading.—Assistant Chief Engineer C. W. Buckholtz last week went over the line of the new short cut between Pottsville, Pa., and Shamokin for the last time. Proposals for the work on this line will soon be called for.

Pittsburgh, Cleveland & Toledo.—Track on this road is now all laid from Akron, O., eastward to Leavittsburg, 38 miles. From New Castle Junction, Pa., the track is laid northwest 22 miles, leaving about 3 miles to reach Youngstown. This section and the 17 miles between Leavittsburg and Youngstown will, it is expected, be completed by the end of October. Messrs. Wm. McCreery and E. K. Hyndman, the contractors, are building the engine houses at Akron and New Castle, and will soon begin the erection of the shops at Youngstown.

Richmond & Danville.—This company's statement for its own and controlled lines for August and the eight months ending Aug. 21 is as follows:

	August.	1882.	Eight months.	1882.
Gross earnings:				
Char., Col. & Aug.....	\$58,770	\$48,296	\$499,350	\$421,905
Col. & Greenville.....	49,205	45,108	451,096	415,528
Rich. & Danville.....	317,595	296,717	2,354,683	2,215,715
Virginia Midland.....	175,860	143,491	1,105,894	914,949
Western N. C.	44,957	30,734	221,873	146,441
Total.....	\$946,403	\$864,346	\$4,578,896	\$4,114,538

	August.	1882.	Eight months.	1882.
Net earnings:				
Char., Col. & Aug.....	20,363	9,938	206,441	81,123
Col. & Greenville.....	8,634	2,943	131,540	51,584
Rich. & Danville.....	115,215	108,686	979,200	689,821
Virginia Midland.....	96,488	60,572	417,027	294,958
Western N. C.	14,049	15,818	75,410	23,853
Total.....	\$259,749	\$197,957	\$1,810,018	\$1,091,339

For August all the lines show a gain of \$82,057 or 14.5 per cent., in gross earnings, and of \$61,792 or 31.2 per cent., in net earnings.

For the eighth month the general result was an increase of \$464,358 or 11.3 per cent., in gross earnings; a decrease of \$254,321 or 8.4 per cent., in expenses, and an increase of \$718,679 or 65.9 per cent., in net earnings. This shows

both a gain in traffic and a large reduction in working expenses.

On the Richmond & Danville lines alone for the eight months there was an increase of \$138,968 or 6.3 per cent., in gross earnings, with a decrease of \$200,411 or 12.7 per cent., in expenses, the result being a gain of \$339,379 or 53.0 per cent., in net earnings.

The committee representing merchants of Norfolk, Va., has presented to the officers of this company a memorial advocating a branch or extension to Norfolk from the company's line, and offering to subscribe part of the capital needed. The committee reports that the memorial was very favorably received. The plan to build a line from Norfolk southwest to Goldsboro, N. C., a distance of about 140 miles, over a level country, where the bridging would be the most expensive part of the work.

St. Louis & San Francisco.—On the extension of the main line from Pacific, Mo., to St. Louis, 35 miles, track is now laid for 31 miles, leaving 4 miles to complete the line to the intended terminus in the city. Work has already been begun on the freight depot and yards. It is expected that the company will run trains to St. Louis on its own track in about two months.

Salina, Lincoln & Decatur.—This company has been organized to build a railroad from Decatur, Neb., through Fremont, Lincoln and Beatrice to the State line, and thence southwest to Salina, in Kansas.

Southeastern, of Canada.—It is stated in dispatches from Montreal that the Canadian Pacific Co. has settled the claim of the Wason Manufacturing Co. for cars furnished the Southeastern road, and has also settled with other claimants against the company. It is also reported that a settlement has been made with the Passumpsic and the Boston, Concord & Montreal companies of their claims. If this be true, the Canadian Pacific is now the only creditor of the Southeastern, and this must be taken as indicating its purpose of keeping possession of the road.

Southern Pacific.—The Governor of New Hampshire has vetoed the bill passed by the Legislature chartering the Southern Pacific Co., with authority to lease and operate railroad and steamship lines anywhere in the United States.

Texas & St. Louis.—A dispatch from Little Rock, Ark., Sept. 18, says: "In the United States Court to-day, Judge Caldwell issued an order restraining the Memphis & Little Rock Railroad Co. from discriminating against through freight or passengers shipped over the Texas & St. Louis Railway in Arkansas. The order was issued in consequence of a circular forbidding the recognition of through freights marked *via* Brinkley, where the Memphis road is crossed."

Texas Trunk.—The directors of this company have resolved to issue bonds at the rate of \$12,000 per mile to provide for the extension of the road from Kaufman, Tex., toward Sabine Pass.

Toledo, Cincinnati & St. Louis.—In Chicago, Sept. 14, Receiver Dwight made application to the United States Circuit Court for an injunction to restrain the Central Trust Co., of New York, from foreclosing a mortgage against the road for a large sum, claiming that such action would embarrass him in handling the property for the benefit of the creditors. The Court declined to issue a formal injunction, but expressed the opinion that the receiver was right in his claims. The Court further stated that it hoped the creditors would consider this expression of opinion as equivalent to an injunction. The matter will be heard more fully at a later date.

Union Pacific.—This company makes the following statement for July and the seven months ending July 31:

	1883.	1882.	Seven months.	1883.	1882.
Earnings.....	\$2,567,806	\$2,205,054	\$15,980,766	\$15,985,279	
Expenses.....	1,357,877	1,220,649	8,509,126	9,022,215	
Net earnings.....	\$1,215,929	\$984,405	\$7,471,640	\$6,963,064	

For the seven months there was a decrease of \$4,513, or 0.03 per cent., in gross earnings; a decrease of \$513,098, or 5.7 per cent., in expenses, and an increase of \$508,576, or 7.2 per cent., in net earnings.

Work is to be begun at once on the extension of this company's Utah & Northern line from Butte, Montana, northward to a junction with the Northern Pacific. The distance is 51 miles, and the line will be laid with a third rail, so that trains of both 3 ft. and standard gauge can use it. Under an agreement made some time ago the Utah & Northern trains will use the Northern Pacific track from the junction to Helena, 50 miles, on which a third rail will be laid, while Northern Pacific trains will have the use of the track from the junction to Butte.

West Virginia & Pennsylvania.—This company has been organized to build a railroad from Clarksburg, W. Va., northward to the Pennsylvania line, the purpose being to connect with the extension of the Southwest Branch of the Pennsylvania Railroad, and with the projected branch of the Pittsburgh, McKeesport & Youghiogheny road. The distance from Clarksburg to the state line is about 40 miles.

ANNUAL REPORTS.

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Wisconsin Central.

This company owns a line from Menasha, Wis., to Ashland, with branches to Portage and several other points, 337 miles in all. Its report is for the year ending Dec. 31 last.

At the close of the year the company leased the Milwaukee & Lake Winnebago road, from Neenah to Milwaukee, 98.2 miles, including 9 miles of the Chicago, Milwaukee & St. Paul track; this road was built during the year and not completed till December. It also leased the Packwaukee & Montello road, 7.2 miles.

At the beginning of the year it leased the Milwaukee & Northern road, 126 miles, but the lease of that road was surrendered July 31.

The statement of earnings and income for the year is as follows:

Wisconsin Central earnings.....	\$1,015,536
Mil. & Northern, seven months.....	357,580
Mil. & Lake Winnebago, unfinished.....	15,364
Total earnings.....	\$1,388,480
Expenses and taxes (64.28 per cent.).....	892,580
Net earnings.....	\$495,900
Balance from previous year.....	517
Total.....	\$496,417

Rentals of roads and equipment.....	\$243,444
Interest on bonded debt.....	112,478
Settlement of old claims.....	301
Settlement with Mil. & Northern Co.....	13,650
New construction and equipment.....	126,586
Total.....	496,457

The gross earnings of the Wisconsin Central road proper for the year were \$3,030 per mile.

The earnings of the Wisconsin & Minnesota line, from Abbottsford to Eau Claire, 54 miles, which is controlled by this company, were \$253,659, or \$4,698 per mile. The working expenses are not given. Payments for interest were \$58,700 and for rentals \$18,500, a total of \$77,200 on this line.

No comparison of earnings is made, on account of the changes in leases, etc., made during the year.

Ohio Central.

This company owns a line from Toledo, O., to Corning, 183 miles, with branches from Hadley Junction to Columbus, 29 miles, and from Corning to South Shawnee, 18 miles; the River Division, from Corning to Middleport, 57 miles, and the Kanawha Division, from Pt. Pleasant, W. Va., to Charleston, 55 miles, making 342 miles in all. The River and West Virginia divisions are separated by a gap of 19 miles still unfinished, which includes a bridge over the Ohio River. Included in the main line are 16 miles of track the use of which is leased from other roads. The following statements for the year ending June 30 were presented at the recent annual meeting.

The River and Kanawha divisions were built last year, and were only worked for a part of the year.

The equipment consists of 47 engines, 12 passenger cars, 4,578 freight cars and 36 service cars. Most of this equipment is held under car-trust agreements.

The stock and debt are as follows:

Stock, Main Line.....	\$12,000,000
" River Division.....	10,000,000
First-mortgage debt on all divisions.....	9,023,000
Income bonds on all divisions.....	7,040,000
Car-trust certificates.....	2,120,000
Floating debt.....	798,583

Total stock and debt..... \$40,945,583

The bonded debt, including car-trust certificates, is \$53,690 per mile of road owned, including the 12 miles of unfinished road.

The report says that there are bonds in the treasury which cost \$1,200,000, and are now valued at \$1,599,486.

The company owns a considerable coal property, through ownership of coal company stock.

The earnings for the year were as follows, on an average of about 260 miles last year, against 225 miles the preceding year:

	1882-83.	1881-82.	Inc. or Dec.	P. c.
Earnings.....	\$1,077,113	\$907,364	I.	\$169,749 18.7
Expenses.....	727,328	551,293	I.	176,035 31.0
Net earnings.....	\$349,785	\$356,071	D.	\$6,286 1.7
Gross earn. per mile.....	4,143	4,033	I.	110 2.7
Net earn. per mile.....	1,345	1,583	D.	238 15.1
Per cent. of exps.....	67.53	60.76	I.	6.77

The net earnings last year were equal to 2.9 per cent. on the funded and floating debt, not including income bonds.

The result of the year was as follows:

Net earnings, as above.....	\$349,785
Taxes and rentals.....	\$80,000
Car-trust interest.....	160,000
Interest on mortgage bonds.....	541,380
Total.....	790,980

Deficit for the year..... \$441,195

In explanation of the decrease in net earnings it is said that there was an actual loss on coal mined and sold to fill contracts, and that rates on coal were very low, owing to competition. The new lines have very little business yet.

Default was made on the River Division coupons due Sept. 1 last. A plan of adjustment is to be presented to bondholders.

Detroit, Lansing & Northern.

This company operates a main line from Detroit, Mich., to Howard City, 160.60 miles, with branches from Stanton Junction to Big Rapids, 63.30 miles, and from Kildaville to Belding, 1.67 miles. There are 59.75 miles of sidings and spurs. Of the main track the company owns 231.57 miles, leasing 8 miles, from Detroit to Grand Trunk Junction, from the Michigan Central, and 1 mile, from Lansing to

North Lansing, from the same company. The report is for the year ending Dec. 31.

The general account, condensed, is as follows:

Common stock.....	\$1,825,600.00
Preferred stock.....	2,563,300.00
Funded debt.....	3,257,000.00
Accrued interest, accounts and balances.....	285,382.78
Unpaid account.....	201,429.10
Total.....	\$8,052,711.04
Road and equipment.....	\$7,477,528.11
Trustees of sinking fund.....	142,106.93
Accounts and balances.....	43,724.67
Supplies.....	61,218.49
Bills receivable.....	186,000.00
Cash.....	142,073.74
Total.....	8,052,711.04

The funded debt consists of \$770,000 Iowa & Lansing first-mortgage 8 per cent. bonds and \$2,487,000 general mortgage 7 per cent. bonds, the interest charge being \$235,690 yearly.

During the year \$44,000 general mortgage bonds were sold to provide for the \$50,000 depot ground bonds paid off in 1881.

The traffic for the year was as follows:

	1883.	1882.	Inc. or Dec.	P. c.
Train miles.....	394,903	385,571	I.	2.4
Passenger.....	717,290	602,038	I.	115,252 19.1
Freight.....	316,254	298,029	I.	18,225 6.1
Service and switch.....	1,428,447	1,285,036	I.	143,411 11.1
Total.....	1,357,757	1,226,880	I.	130,877 10.6
Passenger car miles.....	10,762,572	9,158,616	I.	1,603,956 17.5
Freight car miles.....	635,473	553,725	I.	81,748 14.3
Passenger miles.....	15,858,122	13,741,232	I.	2,116,890 15.4
Tons freight carried.....	743,998	567,371	I.	176,627 31.1
Ton-miles.....	65,277,685	56,069,960	I.	9,207,725 16.4
Av. train load.....	40	36	I.	4 11.1
Passengers, No.....	91	93	D.	2 2.2
Freight, tons.....	2,560 cts.	2,690 cts.	D.	0.100 ct. 3.7
Per ton-mile.....	1.739	1.711	I.	0.028 " 1.6

The total cost of locomotive service was 23.9 cents per mile run. The average earnings per revenue train mile were \$1.44; expenses, \$1.02; net earnings, \$0.42 per mile.

Of the total freight car mileage 37 per cent. was of empty cars. Of the total mileage the company's cars made 45.8 per cent., and foreign cars 54.2 per cent.

Lumber and forest products furnished 74.3 per cent. of the total tonnage, and agricultural products and live stock 11.6 per cent.

The earnings for the year were as follows:

	1882.	1881.	Increase.	P. c.
Freight.....	\$1,136,868	\$959,814	\$177,054	18.4
Passengers.....	410,712	370,475	40,237	10.9
Other.....	49,563	47,409	2,154	4.5
Total.....	\$1,597,143	\$1,377,698	\$219,445	15.9
Expenses.....	1,136,061	934,429	201,632	21.6
Net earnings.....	\$461,082	\$443,269	\$17,813	4.0
Gross earn. per mile.....	7,080	6,108	972	15.9
Net.....	2,044	1,965	79	4.0
Per cent. of expenses.....	71.13	68.33	2.80	4.78

All additions and improvements made during the year were charged to working expenses.

The income account for the year was as follows:

Net earnings as above.....	\$461,082.10
Interest, etc., received.....	10,425.10
Total.....	\$471,507.30
Interest on bonds.....	\$233,975
Dividends on stock.....	229,996
Surplus for the year.....	\$7,536.30
Balance, Jan. 1, 1882.....	51,512.36
Balance, Jan. 1, 1883.....	\$59,048.66

Two dividends of 3 1/2 per cent. each were declared on preferred stock from the earnings of the year, one payable Aug. 15, 1882, the other Feb. 15, 1883. One dividend of 3 per cent. on common stock was declared, payable Feb. 15, 1883.

During the year 2,002 tons steel rails, 270 tons iron rails and 42,648 new ties were used in renewals. There were 13.12 miles new sidings and spurs built. Eight bridges were replaced by improved structures. One brick passenger station and three new water stations were built and 37 miles of new fence put up. The work on the new shops at Ionia was about one-third finished. Four locomotives, a baggage car, 25 stock and 4 caboose cars were added to the equipment.

The earnings for the year show a large increase, and the increase in working expenses was chiefly due to improvements of the property.

Nashville, Chattanooga & St. Louis.

The lines operated by this company at the close of its last fiscal year, June 30, 1882, were as follows:

	Miles
Main Stem, Chattanooga, Tenn., to Hickman, Ky	321
Shelbyville Branch	8
Jasper Branch	25
Fayetteville Branch	40
McMinnville Branch	48
Lebanon Branch	30
Centreville Branch	30
Rock River R. R. (leased)	34

loosa Railroad Co. in January, 1883, in pursuance of agreements previously entered into between the two companies. The remainder of the authorized issue, \$247,000, is held among the assets of your company.

The train and car movement was as follows:

	1882-83.	1881-82.	Inc. or Dec.	P. c.
Train miles....	1,385,948	1,431,479	D. 45,531	3.2
Pass. car miles....	2,875,902	2,607,105	I. 268,797	7.8
Freight car miles....	15,803,323	15,384,624	D. 418,699	0.7
Per train mile:				
Earnings.....	146.7 cts.	131.5 cts.	I. 15.2 cts.	11.5
Expenses.....	83.1 "	77.8 "	I. 5.3 "	6.8

Net earnings... 61.6 cts. 53.7 cts. I. 7.9 cts. 18.4

The average receipts per passenger train mile last year were \$1.02; per freight train mile, \$1.80. The average per train mile for all trains on the Chattanooga Division was \$1.77; on the Northwestern Division, \$0.98.

The expenses per train mile were divided as follows: Maintenance of way, 22.1; motive power, 23.2; maintenance of cars, 9.3; conducting transportation, 21.4; general expenses, 7.1; total, \$3.1 cents.

The decrease in the mileage of trains and freight cars was due to the continued introduction of heavier freight trains, and to a decrease in the mileage of empty cars.

The earnings and expenses of the various lines were as follows:

	Earnings.	Expenses.	Net earnings.
Main Stem.....	\$2,032,913	\$1,152,137	\$880,776
Lebanon Branch.....	72,647	20,692	51,955
McMinnville Branch.....	45,241	24,288	20,953
Fayetteville Branch.....	61,549	26,160	35,389
Centerville Branch.....	30,635	27,684	2,951
Duck River R. R.....	40,538	23,894	16,644
Total.....	\$2,283,523	\$1,274,855	\$1,008,668

In this statement the Shelbyville and Jasper branches are included with the Main Stem.

The earnings of the whole system compare as follows:

	1882-83.	1881-82.	Inc. or Dec.	P. c.
Freight.....	\$1,513,870	\$1,304,067	I. \$209,803	11.0
Passengers.....	921,171	580,500	I. 340,671	7.0
Mail, etc.....	148,477	120,956	I. 27,521	14.2
Total.....	\$2,283,523	\$2,005,523	I. \$278,000	10.1
Expenses.....	1,274,855	1,240,091	I. \$34,764	2.7
Net earnings.....	\$1,008,668	\$865,432	I. \$143,236	16.5
Gross earn. per mile.....	4.182	3.932	I. .250	5.8
Net.....	1.847	1.588	I. .259	16.3
Per cent. of exps.....	55.80	59.81	D. 4.01	...

The report says: "While the sharp competition of lines and the operating of new railroads has divided the tonnage and decreased the through business, it is gratifying to observe a large and gradual increase in the local traffic, which it is expected will continue, and thus render your road comparatively independent of the through traffic, which often has to be carried at non-renumerative rates. The local freights upon the two divisions of the main line for the past two years were:

	1882-83.	1881-82.	Increase.	P. c.
Chattanooga Div.....	\$535,651	\$455,933	\$79,718	24.1
Northwestern Div.....	164,596	94,164	70,432	64.3
Total.....	\$700,247	\$550,097	\$150,150	27.3

"This increase has been attained partially by the encouragement of the location of blast furnaces, mills and factories along the line and at Nashville, but most of the increase may be accounted for by the bountiful crops of 1882 throughout the country traversed by your road.

"The increase in passenger earnings, taking into consideration the opening of new competitive routes and the necessarily increased competition and lower rates for through business, is very satisfactory."

The income statement is as follows:

	Net earnings.	Interest, etc.	Surplus or deficit.
Main Stem.....	\$880,775.74	\$559,433.36	\$321,342.38
Lebanon Branch.....	51,955.08	19,089.67	32,865.41
McMinnville Br.....	20,953.60	12,618.00	8,335.60
Fayetteville Br.....	35,389.02	12,801.12	22,587.90
Centerville Br.....	2,951.50	20,459.56	17,507.97
Duck River R. R.....	16,644.95	26,488.04	9,846.91
Total.....	\$1,008,667.88	\$650,972.35	\$357,695.53
Dividends received on stocks owned.....			18,750.00
Total.....			\$376,445.53
Improvements of road and equipment.....			104,465.32
Surplus for the year.....			\$271,980.21

From this surplus a dividend of 2 per cent. has been declared on the stock, payable Oct. 1 next.

The President's report says: "On July 6, 1881, the Federal authorities instituted suit in the United States Circuit Court at Nashville against this company, for the recovery of the amount of certain coupons from the bonds of the Nashville & Chattanooga Railroad Co., maturing between July, 1882, and January, 1886, amounting to about \$153,000, with interest on each installment from maturity. The bonds held by the government from which these coupons were taken, as well as all subsequent interest, have been paid; the liability of the company to pay the coupons sued upon is denied by the management of the company, but efforts were made to avoid the litigation by offers of compromise, which being refused, the case was tried at the May term, 1883, of said court, and a judgment pronounced in favor of the company, from which an appeal was taken to the Supreme Court at Washington, where the cause is now pending.

"The grading for the extension from Rock Island to Sparta has been completed, together with the piers of Caney Fork and Town Creek bridges. The superstructure of these bridges and track laying will be finished during the present year. This work would have been completed some time since, but last fall a sudden rise in Caney Fork River washed out the staging of the bridge, causing considerable loss to the contractors, and continued high water has prevented the prosecution of the work until a short time ago. There has been expended upon this extension during the year \$129,876.84.

"The Jasper Branch has been extended from Victoria to Inman, 5.3 miles, under the agreement made with the Tennessee Coal, Iron & Railroad Co. referred to in last report. It was built by that company and conveyed to the Nashville, Chattanooga & St. Louis in consideration of the issuance and delivery to them of \$83,000 forty-year 6 per cent. bonds at par. The management of this company, however, in view of the class of traffic—iron ore—that would pass over the road and the heavy engines necessary to move it economically, determined to ballast the roadbed and lay it with steel instead of iron rails. This has been done, making the extension a substantial, first-class road at a cost to your company of \$15,535.61.

"The Centerville Branch has been completed to Duck River opposite Centerville, a distance of 3.4 miles from Dickson, where it connects with the Northwestern Division, and in accordance with contracts previously entered into between the Nashville & Tusculooa Railroad Co. and your company, this 3.4 miles has been conveyed to the Nashville, Chattanooga & St. Louis Railway in fee simple, and a first-mortgage bond put upon it amounting to \$8,000 per mile. Twenty-five of these bonds

have been issued and sold, and the remainder are held by your company.

"An agreement to extend this road to the Lewis County line, 13 miles, was entered into on Dec. 16, 1882, between the Etna Manufacturing, Mining & Oil Co. and your company, for the purpose of developing the rich ore fields of Hickman County, the former company agreeing to erect a blast-furnace at Etna on the line of the extension, costing not less than \$50,000, and to take 50 bonds on the Centerville Branch at an average of 94 cents on the dollar to aid in constructing the extension; the Nashville & Tusculooa Railroad Co. agreeing, in consideration of your company building this road, to convey it in fee simple to the Nashville, Chattanooga & St. Louis Railway when finished. The county of Hickman also subscribes \$1,000 per mile in bonds to aid in the construction. Work has been commenced on the piers of the bridge over Duck River, and the grading of the road from Centerville to the Lewis County line is rapidly nearing completion. This road runs through one of the richest ore banks in Tennessee, and it is expected that a large amount of freight will be carried over it as soon as the furnaces heretofore mentioned are completed."

St. Paul, Minneapolis & Manitoba.

At the close of its last fiscal year, June 30, 1883, this company operated the following lines:

	Miles.
St. Paul, Minn., to Fergus Falls.....	186.51
Minneapolis Junction to East Minneapolis.....	0.61
Minneapolis to St. Cloud.....	62.96
East St. Cloud to Sauk Rapids.....	1.94
St. Cloud to Hinckley.....	66.51
Sauk Centre to Browerville.....	25.75
East Minneapolis to Breckenridge.....	204.82
Breckenridge, Minn., to Portland, Dak.....	100.88
Ev. re-t. Dak., to Mayville.....	45.52
Ripon, Dak., to Hope.....	20.61
Morr. s. Minn., to Brown's Valley.....	47.00
Minnetonka North Shore Branch.....	6.00
Fergus Falls to St. Vincent.....	203.74
St. Vincent to Boundary.....	2.97
Breckenridge to Grand Forks Junction.....	127.48
Grand Forks to Boundary.....	81.13
Crookston to Devil's Lake.....	114.12
Fergus Falls to Pelican Rapids.....	21.37
Shirley to St. Hilaire.....	21.40
Total.....	1,350.32

The total mileage worked June 30, 1882, was 1,057.99 miles, showing an increase during the year of 292.33 miles. The average mileage worked for the year was 1,203 miles, against 926 miles in 1881-82. Of the main track 930.14 miles are in Minnesota and 420.18 miles in Dakota.

There were at the close of the year 28.90 miles of second track and 133.07 miles of sidings, making a total of 1,562.29 miles of track, whereof 881.93 miles were laid with steel and 517.29 miles with iron rails. There were 131 miles relaid with steel during the year.

The equipment consists of 201 locomotives; 85 passenger, 90 sleeping, 8 combination passenger and baggage and 44 baggage, mail and express cars; 8,091 box, 1,600 flat and coal, 63 stock and 110 caboose cars; 3 business and pay cars, 11 derrick and tool and 34 dump cars.

Additions made during the year were 64 locomotives; 26 passenger, 8 sleeping and 8 baggage cars; 6,090 box, 293 flat and coal and 36 caboose cars; 3 derrick and tool cars.

Besides these additions, extensive repairs were made to the old equipment, and a number of engines and cars were rebuilt.

The Land Department reports sales for the year of 104,245 acres for \$587,387.22 and 460 town lots for \$31,829.33. The total number of acres sold to the close of the year was 1,436,341. The cash receipts on land account last year were \$901,231.94; expenses of the department, \$57,387.41; net receipts from land, \$843,844.53. At the close of the year the company held 2,411,659 acres of land unsold, besides 428,000 acres included in the Minneapolis & St. Cloud land grant. The amount of deferred payments due the company on land sales was \$1,158,566.32, being 7 per cent. interest.

The general account, condensed, is as follows:

	\$20,000,000.00
Stock.....	20,791,720.00
Funded debt.....	2,833,333.33
Balance of sinking fund accounts.....	4,384,647.67
Accounts and balances, including accrued interest.....	5,371,076.58
Profit and loss account.....	\$50,851,167.58
Total.....	\$50,851,167.58
Road, equipment and lands.....	\$47,062,336.19
Securities and property of other companies.....	3,025,165.08
St. P. & M. stock.....	5,000.00
Accounts and balances receivable.....	2,295,610.27
Fuel and materials.....	370,518.43
Cash.....	342,037.61
Total.....	\$53,101,167.58
Less land grant bonds redeemed.....	2,250,000.00
	50,851,167.58

The funded debt consists of \$5,750,000 first-mortgage bonds; \$800,000 second-mortgage bonds; \$366,000 old St. Paul & Pacific bonds, and \$969,720 subscriptions to consolidated mortgage bonds.

The item of accounts and balances payable is made up of \$1,857,350.03 due other companies and individuals; \$1,288,325.01 unpaid bills and vouchers unpaid; \$891,847.56 balance Minneapolis Union bonds; \$303,754.91 unpaid pay-rolls; \$543,370.16 interest, taxes, etc., accrued but not yet payable. These floating debt items exceeded the floating assets by \$1,370,881.86.

The traffic reported is as follows:

	1882-83.	1881-82.	Inc. or Dec.	P. c.
Passenger train miles.....	1,183,008	814,794	I. 368,214	45.2
Freight train miles.....	2,373,520	1,617,971	I. 7,5549	45.5
Locomotive miles.....	5,644,806	5,644,806		
Pass. car miles.....	6,653,105	6,653,105		
Freight car miles.....	50,266,731	50,266,731		
Ton-miles.....	341,539,997	189,862,911	I. 151,677,086	79.9
Av. freight train load.....	145	117	I. 28	23.9
Av. rate per ton-mile.....	1.95 cts.	2.51 cts.	D. 0.56 cts.	22.3

There was a general reduction in the freight tariffs over the company's lines during the year.

The average passenger train last year was 5.62 cars; the average freight train, 21.35 cars.

The earnings for the year were as follows:

	1882-83.	1881-82.	Inc. or Dec.	P. c.
Freight.....	\$6,687,935	\$4,773,003	I. \$1,914,932	40.1
Passenger.....	2,433,411	1,387,180	I. 1,046,231	28.1
Mail and express.....	205,233	150,065	I. 55,168	36.8
Rents, etc.....	221,913	119,443	I. 102,472	85.8
Total.....	\$9,148,524	\$6,629,694	I. \$2,518,830	38.0
Expenses.....	4,593,056	3,315,778	I. 1,277,278	30.7
Net earnings.....	\$4,555,468	\$3,313,916	I. \$1,241,552	46.2
Gross earn. p. mile.....	7.903	7.150	I. .753	6.2
Net.....	3.785	3.763	I. .022	12.5
Per cent. of exps.....	50.22	53.03	D. 2.81	...

The average mileage worked was 1,203 miles last year and 926 miles the previous year.

Taxes are included in expenses; they amounted to \$252,063 last year, and \$192,008 the previous year.

The income account is as follows:

	\$9,032,771.80
Earnings.....	\$9,032,771.80
Rent of leased lines.....	57,859.50
Net revenue from Land Department.....	813,944.53
Revenue from other sources.....	149,998.97
Total.....	\$10,054,574.80
Operating expenses.....	\$4,342,092.95
State tax.....	252,063.67
Interest paid and accrued.....	1,264,279.29
Net revenue from Land Dep't, transferred to sinking fund.....	813,944.53
Dividends paid.....	1,774,664.60
	8,397,943.44

Balance, surplus for the year..... \$1,656,631.36

The dividends include one semi-annual of 3½ per cent. and three quarterly of 2 per cent. each, making 9½ per cent. in all.

It will be observed that the earnings given above differ somewhat from the statement given elsewhere in the report.

ADDITIONS TO PROPERTY.

Improvements made during the year include the second track from Minneapolis to Wayzata; new yards at St. Vincent, Barnesville and St. Cloud; the replacing of iron rails with steel; the completion of the new shops at St. Paul; the enlargement of the St. Paul yard by the removal of the old shops; new passenger stations at St. Cloud, Fergus Falls, Crookston and 13 minor stations; the erection of five engine-houses and the enlargement of three others; and the erection of 17 new water stations.

The report says: "The line from Larimore west was completed a distance of 40 miles in December, 1882, and the extension to Devil's Lake undertaken this spring and completed so that regular trains were put on July 4.

"The line from St. Cloud to Hinckley on the St. Paul & Duluth road is completed, and has been in operation since Dec. 4, 1882. This line has been laid entirely with steel rails and well ballasted, and gives the company a direct line to Duluth. The business, both local and through, has been very large since the line was opened, and its importance in enabling us to handle coal and other heavy commodities from the lakes to our lines will be apparent.

"Under the contract with the Minneapolis & Northwestern Co. that line has been completed to St. Cloud, and trains began running over the entire line Dec. 17, 1882. It is the intention at an early day to run our through passenger trains over this line, and avoid the present inconvenient way of getting in and out of Minneapolis with our Fergus Falls Division trains.

"Track was extended from Grafton north to the (Manitoba) boundary line, and trains commenced running Sept. 24, 1882, giving a second line between St. Paul and Winnipeg. It is the intention to run through passenger trains over this line in the near future.

"The purchase from the Northern Pacific of the Casselton Branch made it necessary to construct a connection between that branch and the Breckenridge Extension system, which was done by building a line from Everett to Casselton, 3 miles. This was completed so that the branch was put in operation by this company Dec. 11, 1882.

"The Red River & Lake of the Woods road to St. Hilaire, graded in 1882, was ironed this spring, and the line put in operation July 1, 1883. This branch extends beyond the limit of the company's land grant, into a section of government land which is being taken up rapidly by actual settlers, and it is thought, will afford a very satisfactory business to the main line.

"The Sauk Centre Northern road was completed and put in operation to Browerville, 25½ miles, Nov. 27, 1882, making available the large purchase of timber land referred to in the last report, which has secured to us for many years a supply of oak lumber and ties for our use, at prices much lower than would have been otherwise obtainable."

The company's mines at Angus have enabled it to secure coal for the locomotives at a less cost than heretofore. About 120,000 tons were obtained from these mines.

GENERAL REMARKS.

The report says: "During the past year an agreement was made between this company and the Northern Pacific by which some of the new east-and-west lines, in process of construction by this company, were exchanged for north-and-south lines which had been built by the Northern Pacific. Such an adjustment of existing differences was also had as will prevent disastrous competition between the respective lines.

"In accordance with the resolution of your board of directors of April 12, 1883, this company has acquired title to the Minneapolis & St. Cloud, the Minneapolis & Northwestern and the Sauk Centre Northern roads, the money for the construction of these lines having already been advanced by this company. Title has also been acquired to the Casselton Branch and the Pelican Valley Branch, which were purchased from the Northern Pacific. All of these lines are now consolidated with the St. Paul, Minneapolis & Manitoba Railway.

"Land-grant bonds to the amount of \$750,000 have been redeemed and canceled during the year from proceeds of land sales, under the terms of the mortgage.

"The board of directors on April 12 last authorized the stockholders to purchase the new consolidated mortgage bonds of the company to the amount of 50 per cent. of their holdings at 10 per cent. of their par value; which privilege the stockholders have availed themselves of. This action was deemed by your board wise and for the best interest of the company, in view of the fact that new properties and lines of railroad had been acquired, the value of which had been added to the property and fairly belonged to the stockholders, and ought properly to be represented in the basis of the fixed charges of the company.

"The latest and most authentic reports indicate that there will be more than an average yield of wheat of quality equal to any heretofore harvested. From the best information we have there will be an increase of 25 per cent. in acreage, affording a corresponding increase in tonnage.

"The business of the company during July, August and September, 1882, showed an increase of 100 per cent. over the same months of the year previous, while the business of the entire year just closed showed a gain of 38 per cent. over the previous year. The enormous gain for the first three months was largely due to the transportation of rails, track material, timber, etc., for the Canadian Pacific Railway, the construction of which was being rapidly pushed, and a large amount of material was accumulated by that company for this year's work. The opening of the Thunder Bay Branch of the Canadian Pacific has taken a considerable amount of the freight traffic going to Manitoba via Lake Superior, which has hitherto gone via Duluth and our lines. Notwithstanding the large amount of railway material carried last season and the opening of the Thunder Bay Branch of the Canadian Pacific, our earnings from Jan. 1, 1883, to Aug. 1, 1883, show an increase of \$40,981 over the corresponding months of last year.

"Attention is called to this particularly to show that the general business of the company is in a growing condition. Our local business shows a satisfactory and steady increase, and the rapid settlement of the country tributary to our lines may be relied upon to maintain the earnings of the company."